THIRTIETH ANNUAL REPORT

Illinois Farmers' Institute

A Handbook of Agriculture

Proceedings of the Thirtieth Annual Meeting Held in Paris, Ill., February 18, 19 and 20, 1925, Together with Reports of Institute Work for the Year Ending June 30, 1925

H. E. YOUNG, Secretary, Springfield, Illinois

[Printed by authority of the State of Illinois.]

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SCHNEPP & BARNES, PRINTERS
SPRINGFIELD, ILL.
1925
41791—50M

LETTER OF TRANSMITTAL.

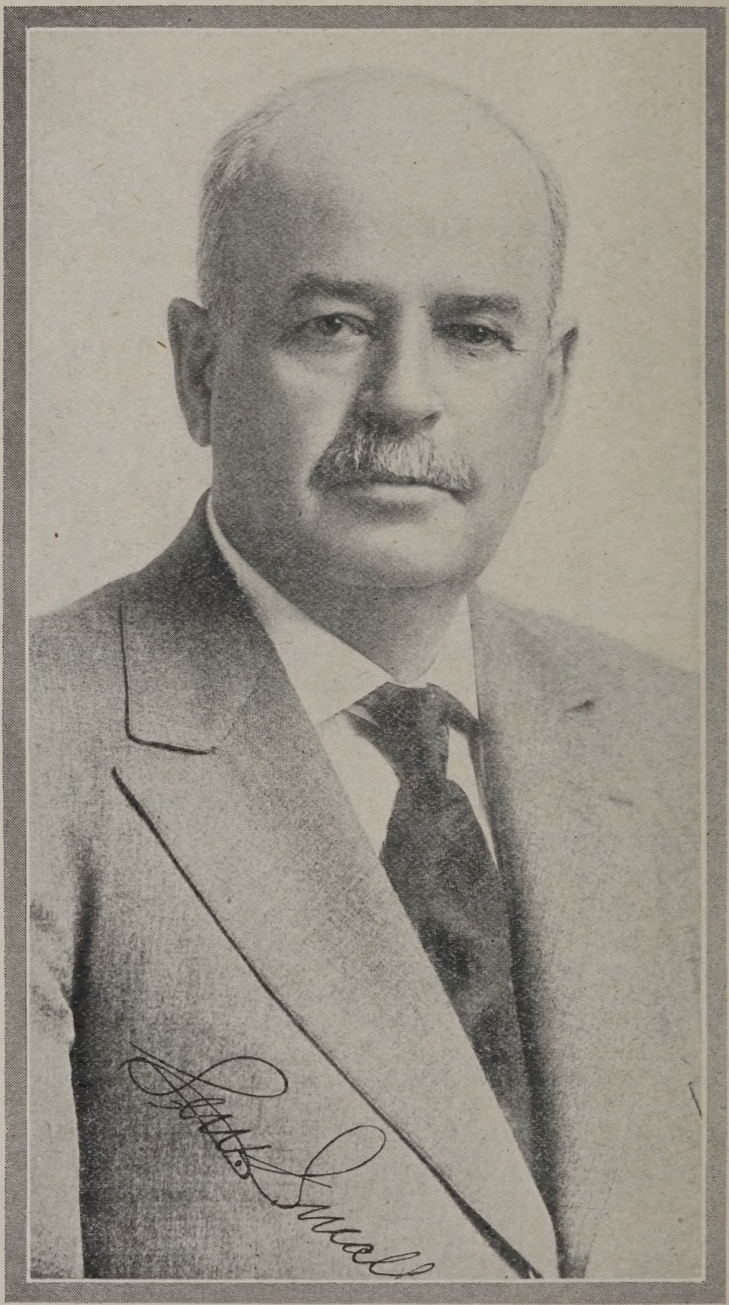
To His Excellency, Len Small, Governor of Illinois:

DEAR SIR: I have the honor to transmit herewith the Thirtieth Annual Report of the Illinois Farmers' Institute for the fiscal year ending June 30, 1925.

Most respectfully yours,

H. E. YOUNG, *Secretary.*

Springfield, Illinois, July, 1925.



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ILLINOIS FARMERS' INSTITUTE

1925-1926

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PARIS

EDGAR COUNTY, ILLINOIS

WHICH ENTERTAINED THE THIRTIETH ANNUAL MEETING OF THE ILLINOIS FARMERS' INSTITUTE, FEBRUARY 18, 19 AND 20, 1925.

Paris, the County Seat of Edgar County, is located 160 miles south of Chicago, 92 miles west of Indianapolis and 180 miles northeast of St. Louis, on the main line of the C. C. C. & St. L. R. R., the Cairo Division of the C. C. C. & St. L. R. R., the Vandalia Division of the Pennsylvania Lines, and the Terre Haute, Indianapolis & Eastern Traction System. It is in the heart of one of the richest agricultural districts in the State of Illinois and has a population of 8,200.

Paris has three National banks and one State bank with total resources of $5,230,500.00; three Building and Loan Associations with total resources of $2,217,323.00; a modern High School, erected at a cost of $250,000.00; five grade schools; one parochial school; one business college; twelve churches; a public library; three theaters; two Daily Newspapers; four hotels, including the new thoroughly modern 75-room Hotel France; a city hospital; a home for dependent children; 25 miles of paved streets; a street car system; two public parks, with children's playground; a motorized fire department, and a municipal water works plant valued at $300,000.00.

The principal industries are: Merkle Broom Company (the largest in the world); McGuire-Cummings Car Factory; U. O. Colson Company (largest manufacturers of advertising specialties in America); Paris Glove Company; Paris Broom Company; Stepp & Anderson, manufacturers of thermos poultry fountains; two packing plants, and one wholesale grocery commission house.

Edgar County is noted for its agriculture, improved live stock and diversified crops. It leads in tuberculosis eradication, being the first accredited county in Illinois. Its five live stock shipping associations marketed $303,000.00 worth of live stock in 1924, and its poultry associations operate a cooperative hatchery for the benefit of members.

Edgar County has over seventy-five miles of brick and concrete pavement, connecting with Terre Haute, St. Louis, Danville and Chicago; three hundred miles of gravel and stone roads, and more than forty miles of oiled highways.

Edgar County has an active Farm Bureau with a membership of over six hundred, and a live County Farmers' Institute with an average annual attendance of over 2,000. The Paris Chamber of Commerce has over three hundred active members. These three organizations have co-operated in bringing the State Institute to Paris, and earnestly and cordially invite the general public, throughout the State, to attend its Session. Paris and Edgar County are prepared to extend a sincere welcome to all visitors.

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RECEPTION.

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PROCEEDINGS OF THE THIRTIETH ANNUAL STATE INSTITUTE MEETING.

Paris, Illinois, Wednesday, Thursday and Friday, February 18, 19 and 20, 1925.

WEDNESDAY MORNING SESSION.

February 18, 9 o'Clock A. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: The Convention will please come to order. We will open the session with a "Community Sing" lead by Rev. A. A. Gordanier.

Community Sing .....Ensemble

PRESIDENT ALLEN: We will now have the invocation by Dr. E. L. Lord.

Invocation .....Rev. E. L. Lord

PRESIDENT ALLEN: The next number on the program is a violin solo by Mr. Raymond Morris.

Violin Solo .....Raymond Morris.

PRESIDENT ALLEN: As the next speaker, I have the privilege of introducing to you Mr. John O. Honnold, the President of the Edgar County Farm Bureau. Mr. Honnold:

MR. JOHN O. HONNOLD: MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE:

I esteem it a great pleasure and honor to welcome the Illinois Farmers' Institute to our beautiful little city of Paris and community for this, your Thirtieth Annual Meeting. As President of the Edgar County Farm Bureau, I wish to speak for our entire membership a most hearty welcome to the great institution which has, in reality, been the parent to the Farm Bureau movement. I wish also to include all other interests and organizations of our community, especially our County Farmers' Institute, the Paris Chamber of Commerce and the county press as earnestly greeting you.

The State Farmers' Institute held its first meeting in 1896, the same year in which our Edgar County Farmers' Institute was organized. Our local institute has made steady progress from that small beginning until its now complex organization. The present high standard of agriculture and the livestock industry in Edgar County is to a large extent due to the education of our farmers and towns people through the Farmers' Institute during the past thirty years. What our County Institute has meant to us locally, the State Institute has a corresponding value throughout our great State of Illinois.

As I look into your smiling faces this morning at the beginning of this Institute, I am first impressed with the most intelligent looking audience

of business men ever assembled in Paris, and no doubt the speaker this very moment across the street before the Department of Household Science is telling our good wives a similar compliment, and I am sure it will be appreciated by them much more than you have indicated to me. Secondly, I can see back of your smiles a determined and inquiring mind as to the best methods of continuing to feed and clothe the people of the world, and at the same time leave behind a fertile soil and a healthy, honest, industrious and Christian young manhood and womanhood as worthy stewards. And, not until we have accomplished all these will we have served the sacred trust which God has commissioned unto us as tillers of the soil. In order to accomplish this great task we need to have come to our assistance our Department of Agriculture, Experiment Station, Agricultural College, Farmers' Institute, Farm Organization, Agricultural Press and many other agencies. The old saying that we shall cause two blades of grass to grow where one has grown is not sufficient today. We now have in addition the two great unsolved problems of regulating the supply, and of marketing the products of the farm. For what shall it profit a man if he gain a large crop and knows not what to do with it?

In these few remarks I must refrain from getting into too deep subject matter for the excellent program which has been prepared by our State Officers, selecting the best talent in several states, who are specialists in their respective lines, and who will bring to us the messages of agriculture and right living. And, bless your souls, the farmers are not the only ones to derive a benefit from this great Institute, for the merchants, manufacturers, bankers, lawyers, doctors, teachers and ministers may share in the benefits. Especially, I hope that every minister in reach of Paris might attend this Institute. I commend the work of the University of Illinois in its recent efforts of holding Agricultural conferences over the state for the ministers.

In conclusion, I assure you that during your stay in Paris, all we have we gladly share with you. Especially do we invite you to visit our Farm Bureau offices. It will be a great pleasure for our farm advisor, Mr. Enos Waters, to tell you how we put big things across and to show you through the different departments and take you to the basement to inspect the ten-thousand egg incubator throbbing with its burden of life. We will be more than pleased to take you by automobile to view our schools, churches, business enterprises, factories, and a drive on our paved roads in any direction into the most fertile agricultural section of Illinois, to inspect our farms with their flocks and herds.

And, best of all, we want you to mingle with our people that we may know each other better, for the real purpose of the Institute might be summed up in these words: the greatest good we can do is to cultivate ourselves and develop our powers in order that we may be of greater service to humanity.

I thank you. [Applause.]

PRESIDENT ALLEN: In behalf of the Institute, I want to thank the people of Paris for their hearty welcome, and I may say also that irrespective of all that Mr. Honnold has said in his greeting, we have experienced the hearty feeling of welcome since we have been here. As soon as we got off of the train we were assured that we were a welcome group of people.

I wish to take this moment to announce some committees that should take prompt action. The Credentials Committee will consist of the following: Frank S. Haynes, chairman, J. L. Hufford and H. G. Easterly. All delegates should present their credentials to this committee as early as possible and before the meeting of delegates at five o'clock this afternoon.

The Committee on Resolutions will consist of the following: A. N. Abbott, chairman, George F. Tullock, William Webb, E. W. Burroughs, Fred L. Petty, E. G. Theim and Frank S. Haynes. Any resolutions to be brought before the convention should first be presented to this committee.

At the noon hour the Board of Directors of the Hopkins Memorial Association are requested to meet at the dining room of the Hotel France. The

following members will please report: Mr. Mann, Mr. Easterly, Mr. Hayden, Mr. Logan, Mr. Ewing, Mr. Davenport, Mr. Abbott and Prof. Mumford.

It has been the custom of the Farmers' Institute to devote the first half day to the subject of Soil Fertility and for this morning the plan of presentation is to first discuss what is known as "The Illinois System" of soil fertility. This subject will be presented by Dr. L. H. Smith, who was for many years associated with Dr. Hopkins in his work of the study of the soils in this state. Dr. Smith now has charge of the publications of the reports of the Soil Survey, and of the matters pertaining to the investigation of soils.

His talk will be followed by a symposium, which will consist of the experiences of some of the practical farmers in this state. The speakers taking part in this Symposium are: C. E. Hopkins, who has had charge of the Hopkins farm in Marion County, Mr. J. R. Midyette of Ewing, in the southern part of the state, Mr. Martin H. Schoeffer of Hoyleton, Washington county, and Mr. W. L. Mills, of McNabb, Putnam county.

I will now ask Dr. Smith to come forward and open the session.

THE ILLINOIS SYSTEM OF PERMANENT SOIL FERTILITY IN THE LIGHT OF TWENTY-FIVE YEARS OF INVESTIGATION.

Dr. L. H. Smith, *University of Illinois.*

Mr. President and Members of the Illinois Farmers' Institute:

Recognizing the fact that it is the soil of Illinois that furnishes her foremost natural resource, the people of this state twenty-five years ago made provision for a systematic and comprehensive investigation of this resource.

It was in 1901 that the Forty-Second General Assembly granted the first generous appropriation for the investigation of the soils of Illinois by the Agricultural Experiment Station.

It was thru the leadership of the Illinois State Farmers' Institute that this provision was made, and it is this organization that has sponsored, thru its Soils Advisory Committee, the continuance of the work through the years since that time. Thus, we celebrate, at this session of the State Farmers' Institute, the Twenty-Fifth Anniversary of the launching of this great enterprise, the investigations of Illinois soils. It is therefore highly appropriate that some special consideration be given at this time to the subject before us.

Dr. L. H. Smith.

It was in the year 1900 that our revered Doctor Cyril G. Hopkins, then serving as chemist of the Experiment Station, was called to the chair of agronomy, when he began his great life work in the study of soils.

PLAN OF THE SOILS INVESTIGATIONS.

In taking up this investigation of the soils, three main lines of procedure were inaugurated; namely, the soil survey, laboratory experiments, (including greenhouse culture), and field experiments.

In the soil survey the various kinds of soils are classified and mapped in such a manner as to furnish a complete inventory of the soils of the state. When it is finished, every landowner in the state will have a description of the soil on his farm, will know approximately its composition, and will have at hand information relating to its maintenance and improvement. With the fifty-six thousand square miles to cover, this was a gigantic undertaking. The work has progressed steadily, however, through the years, county by county, until about ninety-two counties have now been mapped.

In this work samples representing each soil type are collected and subjected to chemical analysis, and well over half the state has been covered by this phase of the work. To date twenty-eight county soil reports have been published.

Thus the status of the soil survey at the present moment may be roughly summarized as follows: Proportion of state mapped, 90%; proportion of state covered by analysis, 60%; proportion of state covered by publications, 30%.

I have a map here that will serve to visualize the general progress of the soil survey. These ten counties in white color are the ones remaining to be mapped; these darker colored areas are those that have been mapped, and the red colored counties are those for which the published reports have

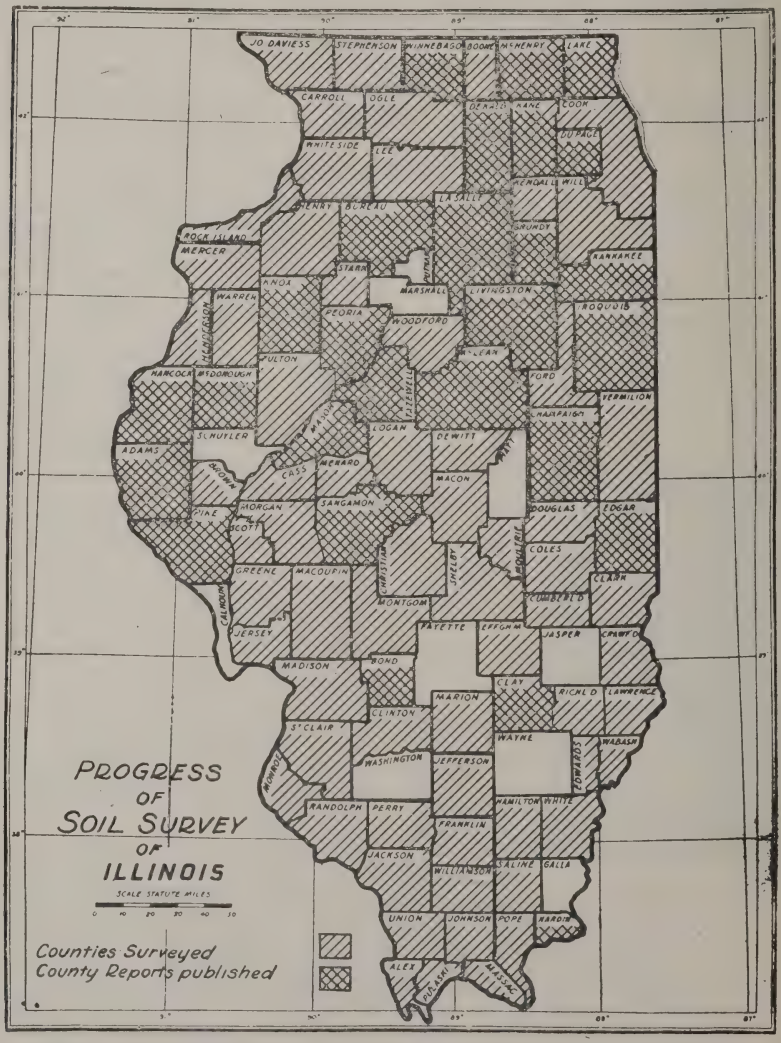


Fig. 1.—Map showing the progress of the soil survey of Illinois.

been issued. As soon as any county is platted, a copy of the map is placed in the hands of the Farm Advisor.

In the first report of the Farmers' Institute, after the soil investigations were started, fifteen experiment fields were reported as having been laid out. Some of these original fields are still being continud. Others have been discontinued; altogether more than fifty have been operated. There are at the present time thirty-five soil experiment fields laid out in plots serving for investigation as well as for demonstration. These fields are so laid out and operated as to give information on practical and permanent systems of farming, including matters relating to fertilizer requirements, proper systems of crop rotations, drainage, prevention of erosion, sub-soiling and dynamiting.

Fig. 2.—Map showing the location of soil experiment fields in Illinois.

This map will serve to give a general idea of the distribution over the state of the soil fields as they are at the present time.

A SYSTEM OF PERMANENT SOIL FERTILITY.

As the results of these investigations accumulated, there was gradually evolved a philosophy or doctrine of soil fertility intended to apply to the

more common soils of Illinois and to similar areas. This body of ideas, relating to the fertility of the soil was enunciated by Doctor Hopkins and it has come to be called the "Illinois System of Soil Fertility."

I have been asked to outline on this occasion the Illinois System of Soil Fertility and I assure you that this task is undertaken with due appreciation of the honor involved. In presenting the subject I shall attempt first to give as nearly as I am able to interpret it, Doctor Hopkins' own conception of the matter, and I do this with no little misgiving, appreciating fully the difficulty of representing fairly and impartially the views and opinions of another.

DOCTOR HOPKINS' RELATION TO THE ILLINOIS SYSTEM.

In speaking of the relation of Doctor Hopkins to the Illinois System, Doctor Robert Stewart has well expressed the matter in his Circular of Illinois Agricultural Experiment Station, No. 245, in the following statement:

> "The great contribution made by the late Doctor Hopkins was the gathering together, studying, interpreting, classifying, and unifying of the known facts of agriculture, into a definite whole as practiced and taught by him in the 'Illinois System of Permaent Soil Fertility.'
>
> "Many of the facts upon which the Illinois System is based have been known for years, and even centuries, and have been developed by other men and other institutions, and in other times. It remained, however, for Doctor Hopkins to bring together and to unify these isolated facts into a definite workable system and by his own investigations to demonstrate clearly that the system could be understood and used by the average farmer on his own fields with very profitable and satisfactory results. In his interpretation of the facts upon which the system is based, all men have not agreed, and some even still do not agree with him. But the system rests on the sure foundation of facts supported by an abundance of experimental data now available from the fields and laboratories operated under his direction."

In the speaker's opinion, the foregoing statement by Stewart is very fair in explaining the great heritage that Doctor Hopkins has left us.

Twelve years ago at the Annual Convention of this organization Doctor Hopkins himself presented an address on the same subject which you will find in the records of the Institute. In the opening paragraph he says:

> "I have been invited to speak upon the Illinois System of Permanent Fertility, but I wish to state in the beginning that in complying with this request, I am speaking in a representative capacity. Many have contributed to the development of this system including both able investigators in other states and countries, my own colleagues in the investigation of Illinois soils, and the truly scientific farmers of this state, some of whom have kept their own farm practice so close up to the work of the Experiment Station as to exert a great influence upon the adoption of permanent fertility."

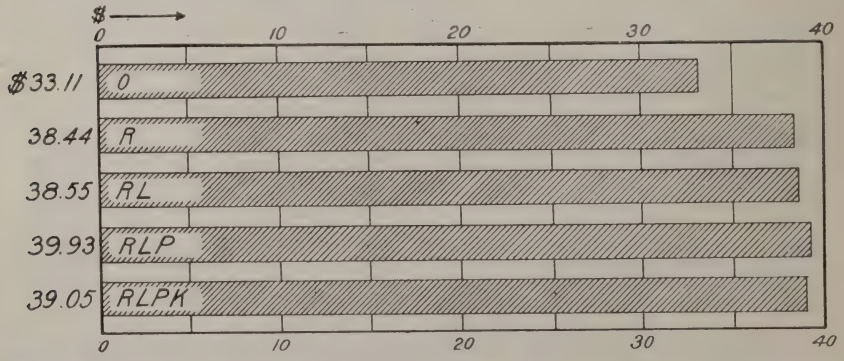


Fig. 3.—Hartsburg Experiment Field—Soil, black clay loam naturally productive —Note the improvement effects by the residues (R) treatment.

Thus we see that Doctor Hopkins himself laid no claim for originality of the fundamental principles upon which the idea of the Illinois System is based.

THE WRITER'S INTERPRETATION OF THE ILLINOIS SYSTEM.

As the speaker understands it, Doctor Hopkins' dominant idea was to provide a system of soil fertility that would result in a permanent agriculture. He recognized that the continual removal of crops from the land must finally lead to soil exhaustion unless the materials taken from the soil be restored. The common practice of applying commercial fertilizers returns to the soil some of the necessary elements, but not in amounts proportionate to the quantities removed by crops, thus producing the effect of a stimulation of the soil rather than that of a sufficient supply of plant food. By restoring the elements to the soils somewhat in excess of the amounts in which they are removed by cropping and thru other natural processes, the soil is not only maintained in its natural fertility, but is actually built up and made more productive. In order to accomplish this effect the elements must be secured in the most economic form, which

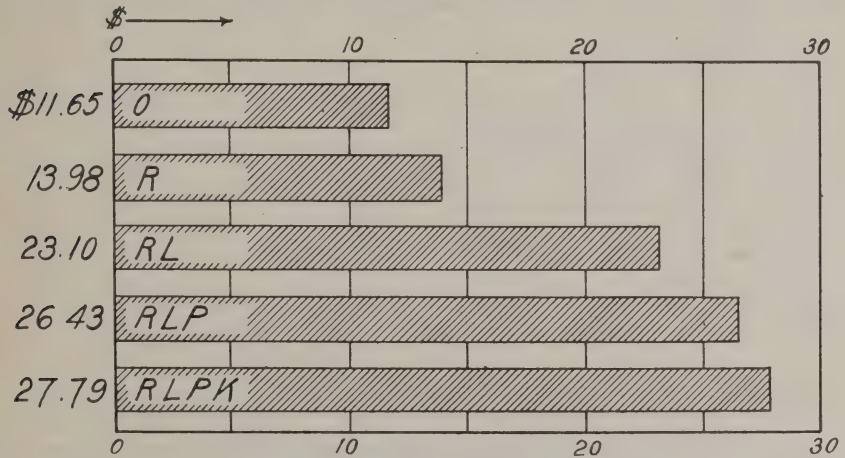


Fig. 4.—Oblong Experiment Field—Soil, gray soil loam on tight clay. Limestone (L) produces the large increase in yields.

ordinarily calls for raw materials rather than those that are treated or manufactured. Thus in ordinary cropping systems, raw rock phosphate should be used and the natural biological process of the soil will make the phosphorus available. Nitrogen should be secured from the air through the growth of legume crops. Potassium is abundant in most normal soils and the problem of supplying this element is usually a matter of liberation from the minerals naturally present in the soil rather than the application of potassium salts. In order that these natural biological processes may function properly, the soil must be supplied with sufficient of basic material, and for this purpose natural crushed limestone serves best.

This is an attempt at a very brief statement of the fundamental or guiding principles of Doctor Hopkins' proposition of a Permanent System of Agriculture. There are hundreds of deviations in details, most of which are yet to be worked out. Such details will vary with different types of soil; they will vary with the kind of enterprise followed, whether grain farming, livestock farming, or fruit farming; they will vary with different economic situations, such, for example, as affect the accessibility and the cost of different forms of fertilizing materials. And so, while we may consider that the great idea of a permanent system of agriculture, and the fundamental principles for carrying it out are established, in reality the

work on this problem is only well begun. The foundation is laid, so to speak, but the great super-structure is yet to be erected before Illinois agriculture as a whole shall be actually upon a permanent basis.

SOME PROBLEMS CONNECTED WITH SOIL INVESTIGATIONS.

In our constant strife to reduce all problems to the simplest formula, we are often prone to disregard complicating elements and there is danger in becoming dogmatic in our statements. If the problems of said management could all be reduced to a few simple formulas there would be no need of the years and years of patient study of conflicting results that we often have to deal with. It seems worth while to consider for a moment some of the difficulties peculiar to soil investigation which are sometimes not fully appreciated.

In the first place, the soil is to be regarded as a dynamic, everchanging, exceedingly complex substance made up of organic and inorganic materials and teeming with life in the form of micro-organism. Because of these characteristics, the soil cannot be considered as a reservoir into which a given quantity of an element or elements of plant food can be poured with

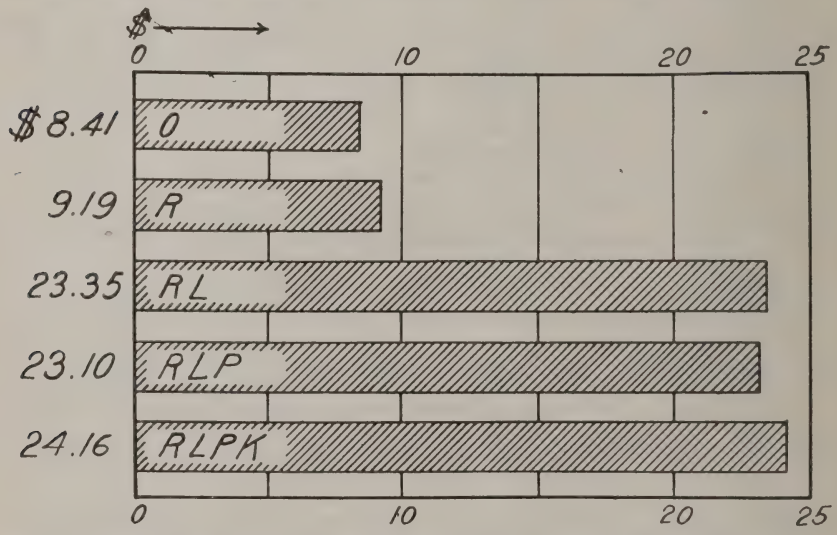


Fig. 5.—Oquawka Experiment Field—Sand soil naturally very unproductive. Notice that limestone (L) more than doubles the yield.

assurance that it will respond with a given increase in crop yield. Likewise it cannot be expected to respond with perfect uniformity to a given set of management standards. To be productive a soil must be in such condition physically with respect to structure and moisture as to encourage root development; and in such condition chemically that injurious substances are not present in harmful amounts, that a sufficient supply of the elements of plant food become available or usable during the growing season, and that lime materials are present in sufficient abundance favorable for the growth of the higher plants and of the beneficial micro-organism. Good soil management under humid conditions involve the adoption of those tillage, cropping, and fertilizer treatment methods which will result in profitable and permanent crop production on the soil type concerned.

In the interpretation of field results all these complexities related to the fundamental nature of the soil are involved. Added to these complexities are the inevitable soil variations which occur in most fields. One plot may not be just like another and thus the response to the experimental treat-

ment is misinterpreted. In such a case many repetitions of the experiment are required.

Again, the seasonal effect of one year upon a given treatment may not be the same as that of another year. On the old Continuous-Corn plot on the Morrow plots the yield in 1916 was 11.2 bushels per acre, and the next year it was 40 bushels. Thus long years of trials are necessary before positive conclusions are warranted.

But these natural complications are not enough; added to these perplexities are those of man-made origin found in the ever changing economic conditions by which market prices are affected. For example, many farmers have enjoyed substantial profit in the use of rock phosphate purchased at $6.00 or $8.00 per ton and with corn selling at $1.00 and even $2.00 a bushel; but when the price of phosphate went up to $15.00 and corn sold at forty cents a bushel, it was a common observation that phosphate was not being extensively purchased.

My purpose in bringing before you these problems with their complexities is not to discourage you in the prosecution of soil investigation or to shake your confidence in them, but rather to warn against hasty conclusions based upon scanty experience or superficial observation, and perhaps to explain the action of the experiment station man when sometimes he seems to be stalling for time in answering the numerous legitimate questions that are put to him.

RESULTS FROM EXPERIMENT FIELDS.

In spite of these various difficulties, however, our soil experiment fields have furnished, and will continue to furnish as the years go by, much invaluable information of reliable character.

May we now turn to some typical results from several of these experiment fields which have a bearing upon our discussion of the Illinois System. In the limited time at our disposal I will attempt to show only a section of

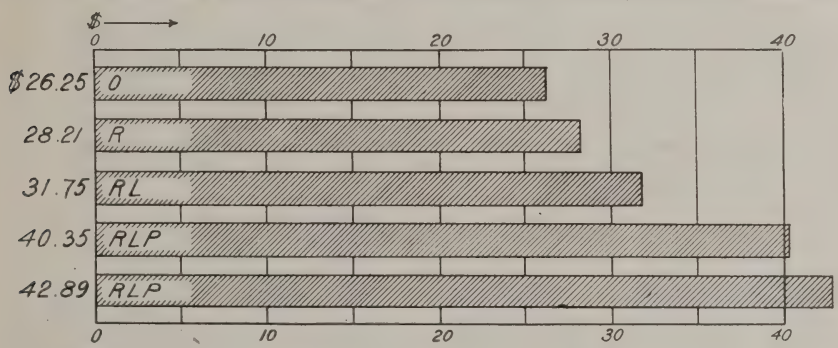


Fig. 6.—Joliet Experiment Field—Soil, brown silt loam. The greatest increase from soil treatment here is effected by the application of phosphorus.

the plots from each field including: (1) a check plot receiving no manurial treatment; (2) a residues plot where stalks and straw, and also legume crops are plowed down to furnish organic matter and nitrogen; (3) a third plot to which limestone is added; (4) a plot which receives residues, limestone and phosphorus; and finally (5) the same as the preceeding, but with the addition of potassium.

These fields are all under a systematic program of crop rotation, the one most frequently used consisting of wheat, corn, oats, and legumes. For the purpose of making these comparisons we have represented the value of the crops produced, upon the basis of per acre per year, and we have assumed values corresponding to the average market prices on December 1st, for the past ten years, with corn at $.78, wheat $1.45, oats $.48, rye $1.10, barley $.80 and hay at $16.03.

The principal thing that I should like to bring out in this connection is that these fields show quite different responses to different treatment.

SPECIAL NEED FOR ORGANIC MATTER AND NITROGEN.

Let us first consider a group of fields which are especially responsive to the residues treatment which, of course, supplies organic matter and nitrogen. The Hartsburg field exhibits such a response. With no soil treatment the crop value is $33.11 per acre per year, but under the residuous system the value rises to $38.44. The limestone data shows no benefit of consequence and rock phosphate in addition to limestone has not given sufficient increase to cover the cost. The addition of potassium shows negative results. This striking increase by the simple addition of organic matter is also found in the results from the Minonk, Rockford and Union Grove fields.

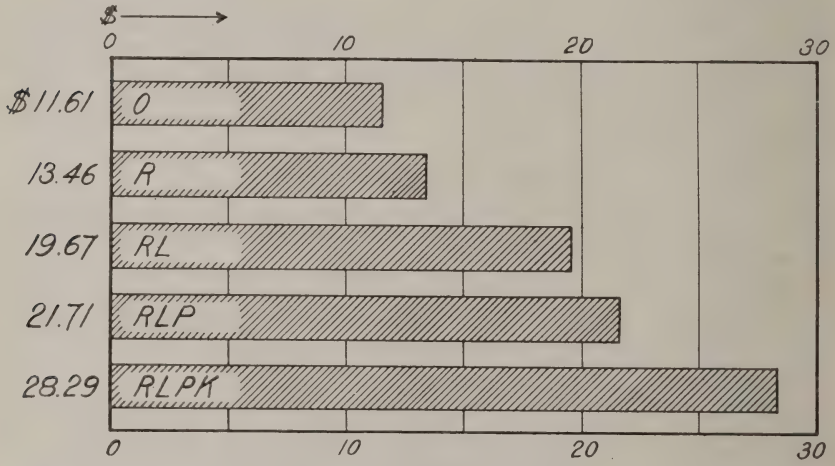


Fig. 7.—Odin Experiment Field—Soil, gray silt loam on tight clay. While limestone (L) is needed first on this land, observe that potassium (K) has produced a still larger increase.

LIMESTONE THE FOREMOST REQUIREMENT.

Let us now turn to southern Illinois where limestone is the foremost requirement. For a typical illustration we may use the results from the Oblong field. The use of limestone on this field has almost doubled the yield. Phosphate applied in addition to limestone has increased it to some extent, and potassium has raised the increase a limited amount. If time permitted, similar results might be shown from Newton, Ewing, Odin, Toledo, and other fields.

In this connection might be mentioned the striking response from limestone on our sandy fields. At Oquawka we have a crop value of $9.19 on the residuous plot, but on the adjacent plot, where limestone has been added, the value rises to $23.35. The short time experiments on the Palestine field exhibit a similar tendency.

Considering briefly the effect of limestone on some of the fields lying outside of the acid region of southern Illinois we find at Mt. Morris a crop increase amounting to $6.50 per acre. In like manner striking results have been produced from the limestone used on the Carlinville, Carthage and Urbana fields. On most of the fields, in fact, there has been some benefit from limestone altho there are a few instances of an actual loss on the limestone plots, as found on the Minonk, Hartsburg, and Rockford fields.

PHOSPHORUS HUNGER.

Speaking next of the fields where the soil has responded to phosphorus in a striking manner we may mention the Joliet field where the phosphorus plots show an increase in the value of crop yields amounting to $8.60 per acre per year, thus yielding a very handsome profit with rock phosphate at its highest cost. Other fields especially responsive to phosphorus treatment are those at Galesburg and Sidell, where rock phosphate has been applied, at Bloomington and Antioch, where bone meal has been the source of phosphorus, and at Urbana, where both of these phosphorus carriers have been tested.

BENEFIT FROM POTASSIUM.

Potassium is an element required by peat soil, but we have found that the addition of potassium salts has produced a marked effect on certain fields not located on peat. Quite a marked result has been produced on the Odin field, by potassium sulfate and the plots at Union Grove show considerable benefit from the use of this material. Kainit has given good results at Ewing.

NO EXHIBITION OF OUTSTANDING RESULTS.

Another group of fields might be shown in which no certain treatment stands out in particular, but the results grade in step-like fashion from one plot to another.

SCOPE OF THE ILLINOIS SYSTEM.

Among the various ideas concerning the Illinois system of soil fertility, one of the prevalent notions is that the system prescribes the application to the soil of certain specific materials, and the omission of, or substitution for, any of these materials represents a violation of the system.

It has been the purpose in presenting these results representing a few typical cases to emphasize the fact that our soils differ tremendously in their response to various treatments, and to show that the building up of soil cannot be reduced to a single method of procedure. The deduction is, that a system of soil fertility must be comprehensive and deal with fundamental principles. A workable system cannot be tied to a single simple formula, or a single method of procedure. With such complex problems to deal with it is inevitable that progress is slow, and it is also probable that occasional mistakes will be made.

In considering this problem a large stock of patience is required and above all, an open-minded attitude must be maintained even to the extent of sometimes changing an opinion. We should maintain in this matter the spirit of our great teacher, Dr. Hopkins, who in the closing words of an address given before this organization nine years ago, said:

> "We must always be open-minded and ready to change our opinion tomorrow, if justified by additional investigation, with accumulated, trustworthy data." [Applause.]

PRESIDENT ALLEN: We will now hear some of the experiences of the farmers, and I will call on Mr. Hopkins first.

POORLAND FARM.

C. E. HOPKINS, *Livingston County, Illinois.*

MR. CHAIRMAN AND GENTLEMEN OF THE ILLINOIS FARMERS' INSTITUTE: It is said that a certain gentleman was once invited to speak before the inmates of Sing Sing Penitentiary, and he opened his remarks by saying "Fellow Citizens." However, he saw his mistake right away, and changed his form of greeting to "Fellow Convicts." That did not seem to be very satisfactory either, but he let it go and proceeded to say "I am glad to see so many of you here." [Laughter.]

I always try, in discussing any particular question, to avoid overselling it. I heard a story recently in line with the point in question. A man who was decidedly bow-legged and who was very much concerned about it, went

Carl E. Hopkins.

to see Professor Coue, the great auto-suggestion expert. Professor Coue told him that his trouble was largely imaginary. The Professor said to the gentleman: "YOU have been letting your imagination run along wrong lines and the thing to do is to just reverse your imagination and I think you will get along all right." He said further, "When you go home tonight and go to bed, just repeat over to yourself eighty times, these words 'Every day, in every way, my legs are straighter. Every day, in every way, my legs are getting straighter." Well, after talking with the professor the gentleman became quite enthused over his suggestion. He went home and went to bed an hour or so before his usual time, but he forgot to stop repeating the sentence when he got to eighty; he really repeated this phrase one hundrew and twenty times, and when he awoke in the morning he was actually knockneed. [Laughter.]

I have been asked to discuss with you for a short time this morning the plan of work at Poorland Farm, as outlined and directed by Dr. Hopkins, together with the results and accomplishments. I think it may be appropriate to speak first of the thought and purpose which prompted this undertaking.

THE PURPOSE OF THE FARM.

In his study of the soils of Illinois, Dr. Hopkins found an extensive area of land, covering some twenty counties in the south-central part of the state, which was extremely low in productive power. This particular type of soil is commonly known as Gray Silt Loam on Tight Clay.

After careful and exhaustive investigation, Dr. Hopkins became convinced that these soils were susceptible to and capable of material improvement; that by restoring the fertility of these worn and impoverished soils, together with the adoption of practical rotations, consisting of the kind and variety of crops adapted to the soil and climatic conditions, this land could again be made to produce crops that would pay a reasonable return on the capital and labor invested. In a broader sense, he knew that a similar, or even a more serious condition prevailed in other sections of the country; that millions of acres of land had already been abandoned and were beyond self redemption.

It was because of these convictions and this knowledge that he purchased the tract of land, which later was named and has since been known as Poorland Farm. There is no doubt that the underlying purpose in this undertaking was to demonstrate that this land could be reclaimed and once more made to produce profitable crops.

Dr. Hopkins was an optimist as regards Poorland Farm as he always was when conditions justified. In his little book "The Farm That Won't Wear Out", which many of you no doubt have read, we find him saying:

> "Intelligent optimism is admirable, but fact is better than fiction, and blind bigotry paraded as optimism is dangerous and condemnable. Some one has said that such a bigot is not an optimist but a 'cheerful idiot.'
>
> "To purchase rich, well-watered land at a low price and become wealthy by merely waiting until the land increases in value ten-fold, while making a living by taking fertility from the soil, has been easy and common in the great agricultural states during the last half century.
>
> "But paradoxical as it may seem, land values have increased while fertility and productiveness have decreased, and, with shorter days for higher priced and less efficient farm labor, with more middlemen to absorb the profits between the producer and the consumer, it is now difficult indeed to buy land with borrowed money and pay for it from

subsequent farm profits. If continued soil depletion is practiced, ultimate failure is the only possible future for such investments."

But his faith in this undertaking was such that he, himself, without any hesitation or misgivings, went heavily into debt in making the purchase. And this faith he always retained. Never, for one moment during the years that followed, did he falter or waver. Dr. Hopkins had undertaken this work only after very careful and mature deliberation. He had considered and analyzed the whole matter from every possible angle and had estimated and anticipated the difficulties as well as the possibilities. He fully understood the needs of the soil and knew from the beginning that it would require several years of time, together with much labor and expense, in addition to the purchase price of the land, before he could hope to realize any profit.

From my conversations and correspondence with him, year after year, I am sure he was never disappointed with the results so far as the soil treatment was concerned; in fact he has said to me many times that the crops were better than he expected them to be. Of course, the weather man did throw a good many monkey wrenches into the gears which interfered greatly with our plans and affected the yields, but adverse weather conditions are not confined solely to southern Illinois; and, so far as I am able to judge, Dr. Hopkins was never discouraged and never regretted the venture or the sacrifices he was compelled to make.

SOIL CONDITION AND CROPS.

The original 316 acres of Poorland Farm were purchased late in the fall of 1903 and before Christmas the first carloads of limestone and rock phosphate had been ordered. I am inclined to think now, after reading his correspondence and from certain things he told me, together with my own experience, that without doubt Dr. Hopkins' most difficult and perplexing problem during these first years was trying to keep up the courage of his tenants, which is not at all surprising. He knew from the outset and said repeatedly that it was going to be a long time proposition and expected

Institute Committee on Soil Investigations and Experiments—Ralph Allen, Geo. F. Tullock, F. I. Mann, A. N. Abbott, N. F. Goodwin.

little in the beginning. The tenants were looking for more immediate results and probably expected results which the conditions did not justify.

Some of the land had been practically abandoned for several years prior to the beginning of Dr. Hopkins' work. One 40-acre field had been seeded to wheat in the fall of 1903.

Perhaps I should explain here for the benefit of those who are not acquainted with southern Illinois conditions, that we do not use tile at Poorland Farm because of the almost impervious subsoil, but are compelled to depend entirely upon surface drainage. And, drainage is a real and often a difficult problem, since our average annual rainfall is about 46 inches, if I remember rightly. So we plow our fields in narrow lands, thus having a dead furrow and a corresponding back furrow at intervals of two rods.

Going back to the wheat sown in the fall of 1903: well, it was almost a complete failure. They did harvest the back furrows,—where the soil had a double thickness, so to speak,—one swath of the grain binder every two rods. Another 40-acre field was in hay. It produced 14 loads,—about one-third hay and two-thirds weeds. Assuming they were ton loads, the yield of actual hay was about 400 pounds per acre.

My father, having visited the farm not long after the work was started, told me later of having seen the tenant load all of the shock corn from more than an acre of land on a single wagon bed and haul it to the barn. No, it is not at all surprising that the tenants became discouraged.

My personal acquaintance with Poorland Farm began in 1908, when I became associated with my brother in its operation. I continued to reside on the farm until 1917, and have been closely associated with the work there since that time, although for two years the farm was under the direct management of Mr. Frank H. McKelvey, representing the Hopkins Memorial Association.

When Dr. Hopkins wrote me in 1907 and later came to see me about joining him in the operation of the farm, he had little to offer except possibilities and his own unfaltering faith. Even as late as 1910, as those of you who have read his book "The Story Of The Soil", may recall, he causes Adelaide to say, quoting her husband, in a letter to her parents back in Virginia:

> "Every bushel of corn, oats and wheat that this old farm has produced during the last six years has been wholly at the expense of the meager stock of reserve nitrogen stlll left in the soil after 75 years of almost continuous effort to 'work the land for all that's in it.' We have no right to expect really good crops until after the second rotation is completed, because the clover grown in the first rotation does not have a fair chance, the limestone not yet being well mixed with the soil, the phosphorus supply being inadequate, the inoculation being imperfect, and no provision whatever having been made to supply decaying organic matter in advance of the first clover crop."

And it was not until after the second rotation was completed that we began to get satisfactory results in grain yields, although we did secure some very good clover yields during the second rotation. I quote again from Adelaide's letter:

> "Field No. 4 produced as much real hay last year as all the rest of the farm has produced since the work was started. The hay this year is worth as much for feed as all that has been harvested during the previous five years."

In other words, the crops were improving in quality as well as in quantity; and in this connection I might say that the cattle and horses always found the line in the pastures between the treated and untreated land and were almost never seen grazing on the checks.

The original plan at Poorland Farm provided for a six year rotation consisting of corn, oats, wheat and three years of hay and pasture, usually mixed timothy and clover, in order to build up a reserve of organic matter and humus. The plan also provided for the application of one ton of rock phosphate and two tons of ground limestone per acre each rotation. A

heavier application of limestone would, no doubt, have proved profitable at first, owing to the high acidity of the soil and the extreme deficiency of the element calcium, so necessary to clover, and additional car loads of limestone were applied whenever available time and labor permitted,—ten car loads having been applied in a single year.

Two check strips, three rods wide and containing 1½ acres each, were left on each of the six 40-acre fields when the work began, and with one exception these checks still remain. One of these checks on each field has received no soil treatment during the entire twenty-one years except that farm manure has been applied in cases where the field itself received manure. The other check has received limestone, but no phosphate, while the balance of the fields have received both limestone and phosphate.

CROP RESULTS AT POORLAND.

Now, as to results. Owing to the inconvenience and expense involved, we have not attempted to keep records of yields every year. We have, however, secured records at intervals, comparing the treated with the untreated portions of the fields. I might say in this connection that certain crops are better adapted to this section of the state than others. For example, our experience with corn and oats, except in occasional years, has not been as encouraging as with wheat. This is due primarily to the fact that these crops mature later than wheat; neither do they get as early a start in the spring, and consequently are more susceptible to drought and suffer from it to a much greater degree. However, we have produced some very satisfactory corn and oats crops, running as high as 40 to 50 bushels per acre. A portion of a field of oats in 1917 that was seeded very early yielded 75 bushels per acre.

However, for reasons already stated, Southern Illinois is better adapted to wheat, grass, cattle and fruit. Our experience with wheat and clover during recent years has been very gratifying, adverse weather conditions considered. In 1913 the untreated land produced 11½ bushels per acre; the limed check 15 bushels, while the combination of lime and phosphate produced 35½ bushels. The heaviest yield was in 1917 having been seeded in the fall of 1916 and harvested after I left the farm. The untreated land produced slightly less than 8 bushels per acre, 7.7 bushels, to be exact; the limed check yielded 21.3 bushels and the portion of the field having received both limestone and phosphate yielded 44.1 bushels, or an increase of 36.4 bushels per acre for the soil treatment.

At that time this particular field had been under the system of treatment for 14 years. The treatment had cost, as an average, $2 per acre per year, or a total of $28. This one crop of wheat paid the entire cost of the soil treatment during the preceding 14 years and left a profit of $44 per acre. Furthermore, at least half of the limestone and probably 75 per cent or more of the phosphorus remained in the soil for the use offuture crops.

For several years we have been observing the residual effect of this soil treatment, no phosphate having been applied since 1916, and only one car load of limestone since 1919. During this time the wheat yield ran as low as 19 bushels one year. Other years it has been 25 to 30 bushels. Last year it promised 30 to 35 bushels, until a few weeks before harvest, but owing to several severe rain and wind storms, it became badly lodged and rust developed to a degree seldom seen in that section. The actual yields were 23¾ bushels on the best field, 14 bushels where limestone had been applied and 4 bushels on the untreated check.

We are having practically no trouble in growing clover, in fact much less trouble than is being experienced in the Corn Belt, as a general average. Our clover crops will average far superior to the clover in the Corn Belt and we have not had a clover failure for years. We are growing sweet clover quite extensively now and thing it is going to help to solve our tight sub-soil problem; at least, we think it will help the corn and other late maturing crops to withstand drought. Soy beans and cow peas have been grown to some extent and are among our more certain crops.

SYSTEM FUNDAMENTALLY SOUND.

Let me say in conclusion, from my experience and observation I am becoming more and more convinced as the years go by, as to the fundamental soundness of the Illinois System of Permanent Soil Fertility; in fact, even while I was engaged in the operation of Poorland Farm, I never had any doubt as to the practicability and effectiveness of the soil treatment, although I confess that I did use to become very much peeved and aggravated with the weather man, and I think with good and sufficient reason. For example: In 1914 from early April until late in August he gave us not to exceed 2 inches of rain. I planted corn that year in May which did not sprout until late in August. That was my best corn, the chinch bugs having taken the earlier planting. And in 1915, from the 20th day of May to the 21st day of August we had a total rainfall of 36 inches. I could talk for a long time about my experiences in 1915, but I prefer to forget them.

We have also had our share of insect pests,—chinch bugs, army worms, and the like. The venture has not been all roses and sunshine; on the contrary, it has been a long, up-hill pull. We were not able to do many things we would like to have done. We felt that our first job was to feed the soil so it could produce crops, otherwise the whole project would have had to fail. We did not build a new house although we needed one. We did not have modern conveniences. We did not have an automobile in those days; in fact, we didn't even have a Ford. We did build a new barn, and a good one. We erected two silos. We did an immense lot of fencing and we applied 66 car loads of limestone and 23 car loads of rock phosphate. And we have harvested three tons per acre of as fine a clover hay as ever grew; we have threshed five bushels of alsike clover seed per acre and we have grown wheat that yielded 44 bushels per acre, which is within 10 bushels of Frank Mann's eight year average on his $500 land with four tons of rock phosphate.

I think I have taken all the time I should, but I just want to say in closing, as I have said on previous occasions: I would not accept the average farm in Southern Illinois as a gift if I had to agree to live upon it, operate it and try to make my living from it, if for any reason I was not able to build it up by a system such as has been outlined here this morning. On the other hand, after having been in very close touch with this work for the past seventeen years and after having devoted five years to Farm Bureau work in one of the best counties in the state, in the heart of the corn belt, I am not at all sure but that southern Illinois land, at the price at which it can be purchased today, if properly handled, will prove to be a more profitable investment than the land in the Corn Belt at prevailing prices; I am not sure but what it will return a higher rate of interest on the investment. I thank you. [Applause.]

Q. I would just like to ask Mr. Hopkins one question that arose in my mind, if in his opinion the improvement of the soil does not go a long ways to overcome the adverse climatic conditions?

A. Yes, I think there is no doubt that as the work is continued and more organic matter and humus are incorporated into the soil, we will have less difficulty from the severe droughts which we frequently have. That is one of our serious problems, the sub-soil being almost impervious. We do not have much of a reservoir for surplus moisture. The water can't go down, and when it gets dry there is not very much to come up, and so our crops suffer; however, if we can grow these deep-rooted legumes and incorporate more organic matter into the soil to a greater depth, I feel that it will be of great benefit, especially in times of drought.

Q. And when you have that you can have tile drainage too, can't you?

A. Tile can possibly be used to advantage then. It is neither practical nor profitable at the present time. I thank you. [Applause.]

PRESIDENT ALLEN: I will next call on Mr. Midyette for a few remarks.

ILLINOIS SYSTEM GIVES RESULTS.

J. R. Midyette, *Franklin County, Illinois.*

Mr. Chairman and Members: I don't know as I have very much to tell you. Mr. Hopkins has about made my speech. I farm the same type of soil, or, very near the same type of soil that Poorland farm has. I was there last summer when they had the meeting there and it differs from my soil in only one way, it don't have quite as good drainage as I have. Most of my land is well drained; it lies rolling enough to drain, but I found that Poorland farm is not so fortunate.

Let me take you back to the year 1908 at which time I moved onto the 120 acres of land that I now own in Franklin County. In 1906 we bought this farm, eighty acres lying there and forty here (Illustrating) on two

Mr. Midyette holding single sweet clover plant.

public highways. The town of Ewing is one-half mile south of here. This is what we call the Home eighty as we bought that first. The coal company had taken our other land, so on the 6th day of November, 1906, we purchased the 80 acres at $42 an acre, and this forty acres which they said was a "pretty" one, for $35 an acre. The old man living in that part of the county encouraged me very much. They said I would starve to death. One said "Yes, your work mares are fat now, but they will never be that way any more."

When we made our payments on this land, we lacked $1,200 of having enough money to pay for it, and we had no house and we had no barn whatever. I built a barn that fall that cost me $800. I expected to make this my home for the rest of my days, and we put a barn 50 feet square that cost us $800. Of course, I had to borrow the money to pay for it. We had no house fit to live in, but we did live in it that winter and a part of the next summer, and in August we commenced to build a new residence. My carpenter told me it would be about $700 with what old stuff we could use out of the other building, but when the bills finally all came in they amounted to over $1,500. That winter I had some good young mules and horses, and I sold enough of them to pay off about half of what I had borrowed, or a little more, leaving something over $2,000 left to pay.

This land was more fertile than Dr. Hopkins' land was. We could raise 20 bushels of corn in a good season and we could raise 15 bushels of oats and we could raise from a ton to a ton and a half of timothy and

Spreading limestone.

sometimes half a ton of red top hay, but we could raise no clover whatever,—clover would not grow. I spent some money for clover seed, and I found that I might as well have poured it into the fire as seed it on that land.

We worked for four years, my family and I, and we got no further up the hill. We paid our taxes and our interest, and that is all we could do. We just lived. Don't think for one minute that we didn't have plenty to eat, because my wife always found plenty to eat around the farm.

I am going to tell you now about this old forty, the forty that the old men there said "was no account whatever, it never raised anything and never will raise anything." As I said, we got very badly in debt and I borrowed more money to buy limestone when I saw what the experiment station was doing. I figured that if they could increase crop yields with limestone as much as they did, if they could double the yields and triple them, that I could do so too. So I went and borrowed more money from the banker at Ewing. The man across the road had the mortgage and he always said he wanted to get the farm. I had to give him a mortgage on the entire hundred and twenty acres and after I had paid all but four hundred dollars, he wanted that land.

YIELDS MORE THAN TREBLED.

Now, I will give you the yields, and if you wish, you may put them down. Field No. 9 containing 18.2 acres was limed in 1913, in the spring, two and one-half tons per acre after which it was planted to corn and it raised 14 bushels to the acre.

In 1914 this same field was seeded to oats, and whereas it had only been yielding 10 bushels of oats. You see as Mr. Hopkins has said, that you have to get around to the second rotation before you begin to get a very large increase. I seeded clover on those oats and failed to get any clover, and in 1914 plowed it for wheat and put on about two tons more of limestone. In 1915 we raised 17 bushels of wheat. One year it was in wheat before it was treated, and it made 3 bushels per acre. Timothy was seeded with the wheat in the fall and the clover was seeded in the spring of 1915, and in 1916 it produced 3 ton of clover and timothy per acre.

That timothy stood about this high to a man and the clover was just about up to the top of the timothy. It raised 3 tons of hay to the acre,

Spreading manure in sweet clover to plow under for corn.

the best we could tell, as we only weighed a limited number of loads and figured it from that. That is the way we got the yield. We didn't weigh every load because it was not baled, but put in the barn loose.

In 1917 it was still in clover and timothy and raised two tons and a half to the acre of hay. There was no more lime put on. It was manured on the clover stubble in the winter of 1916. In 1918 it was in clover and timothy and raised two and a half tons to the acre. In 1919 it was in corn and raised 45 bushels to the acre. For three years it was in clover and timothy and raised eight tons of hay to the acre. In 1919 we also had 45 bushels of corn to the acre, and in 1920 it was in corn again, but was manured with 10 or 12 loads to the acre and raised 42 bushels. In 1921, without any more treatment it raised 26 bushels of oats to the acre instead of raising ten as it had before. In 1922 it was in sweet clover. This sweet clover was sown with the oats. We commenced about the 17th day of April to seed those oats and finished the 23rd. It rained during the time we were putting them in, and I aimed to pasture the cows in this field that year. We had about 20 head of cows at that time, and I aimed to turn them in about the first of April, but it was so very wet that I waited on account of tramping down the soil until about the 1st of May. The sweet clover was then something like waist high, and believe me, later it was a hard

Sweet clover before plowing under.

job to find those cows in that field. We didn't have an aeroplane, but three of us had to hunt for these cows every morning in that 18 acre patch and then sometimes we would fail to find them and we would have to go back to the barn and get the horses and go after them. Almost any place in that field you couldn't see a cow ten feet away from you to save your life. It was just as thick as it could stand.

FIFTY TWO BUSHELS OF CORN—THREE AND ONE HALF OF CLOVER.

We intended to plow that under in August and seed it to wheat, but before we had a chance to do that, the crop died. Any of you who have raised sweet clover know that when the top of the plant is dead the root

Plowing under sweet clover for corn.

is gone. We did plow it in the spring of 1923 and planted it to corn, but the trouble was we planted it a little too early for our country and we failed to get a good stand. We re-disced it and planted it again the second time and then raised 52 bushels of corn to the acre.

Cutting sweet clover for hay.

This last year, 1924, it was seeded to soy beans the first week in June and harvested the first week in September, and we got 2¼ tons of hay, where we cut it for hay, and in the three acres where we cut it for seed, we got about 18 or 19 bushels of beans per acre.

Q. Is that figure per acre?

A. Yes, sir, 18 to 19 bushels per acre from that patch. We kept this for seed and the cows ate the straw.

The other half of the "pretty forty", as they called it, is the 18.8 acres here, and I will give no record of that back of 1917, because it may be too tedious to listen to figures all the time.

Q. You have applied no phosphate to this land, have you?

A. This field here has never had any phosphate except about 225 pounds of bone meal has been applied to it per acre. That is all the phosphorus it has ever had, but the north side has had a little over 20 tons of phosphorus.

In 1917 this field was in corn and raised 44 bushels per acre. As near as I can tell you, about the same amount of limestone and about the same

Alfalfa on Midyette farm.

amount of manure has been hauled to it and one crop of sweet clover has been plowed under on it. In 1917 it raised 44 bushels of corn; in 1918 it raised 36 bushels of oats; in 1919 this field raised 58 tons of clover hay. Now that is going some. It was baled in the field and we knew exactly how much we had. It made 58 tons of hay off of 18.8 acres of ground, or over 3½ tons per acre.

In 1919 it was seeded to wheat and 1920 made 18 bushels of wheat, and in 1921 it was in clover again and raised two tons of clover hay to the acre. In 1922 it was again in wheat and raised 25 bushels of wheat to the acre. In 1923 it was in corn and raised 48 bushels. In 1924 it was in oats and raised 47½ bushels to the acre.

Now, I want to say that using the formula of the Illinois System, or Dr. Hopkins' system, whichever you please to call it, consisting of limestone and manure and phosphate and legume crops, such as sweet clover plowed down, farm land in southern Illinois will not need tile drainage for a number of years to come, unless it is on very flat ground. Last spring after we were through plowing we had the wettest season that we had for quite a while and it seemed that the land never got wet at all. Almost any day we could go on and work it, and we did work it and planted soy beans before we ever broke a furrow for corn. As a word of advice I would say if you farmers would only raise sweet clover for a green manure crop, it would aid very materially in your drainage problem.

That is all I have to say unless there are some questions.

Q. Which field did you sow oats on the other day?

A. I sowed oats on field nine; this is the south field.

Q. Could you have done that had it not had sweet clover on previously?

A. I don't think we could. I think the sweet clover has helped to dry the land out. Now it takes more water.

Q. Tell us about that $400 that went back on the place?

A. Well, I asked the banker if he would take my note, and he said "No." "I would, if it was not like it is." That was at Ewing. Well, I knew I could go to Benton, or any other banker, but I hated to do it. This was in December. So I finally went back to this banker and he said "Well, I will make you the mortgage" and then I told him "I want you to be in here the first day of January, because I expect to settle with you forever", but it went over until the 4th day of February before I did that, and no man has ever held a mortgage on it since. This is one of the oldest farms in Franklin County. It has been cultivated for over one hundred years and made this year something over 40 bushels of corn to the acre.

Virginia's for seed—18 bushels per acre.

Maybe this would interest Mr. Mann. Last Sunday I went out on this field, and not having a spade or a shovel with me, I simply pulled these sweet clover roots up by hand. I would like to ask the question if there are two kinds of sweet clover? They say there are two kinds of alfalfa, the common and the grimm. Now, these two samples grew not over three feet apart, these roots.

Q. When did you pull those roots?

A. Last Sunday evening. I should have had a spade with which to dig them up. This one pulled up soil and all with it. I guess it had about eight or ten pounds of soil with it.

Q. Do they turn when they strike the hard sub-soil or do they still go down?

A. Well, I have followed them down two and three feet and I never found the end.

Q. That ought to help drain your farm then.

A. Oh, yes.

Q. Is sweet clover better plowed under green or is it better to wait until it gets dry?

Winter oats—May 17.

A. Well, I expect there are others who are more able to answer that than I am. However, I think sweet clover is good plowed under any time. The University of Illinois, I think, are making some experiments in reference to plowing it under. Personally I would like to have it get as large and as tall as possble, because I think the one thing that we are more short of than anything else is humus matter, or organic matter, in our soil, and I would like to see as much of it go under as possible.

Q. How much seed do you sow to the acre?

A. About ten pounds of sweet clover.

If there are no more questions, that is all. [Applause.]

PRESIDENT ALLEN: So far we have heard almost entirely from southern Illinois. Now, we have with us a man from considerably up north who will address us, Mr. W. L. Mills.

ROCK PHOSPHATE AND LIMESTONE.

W. L. Mills, *Putnam County, Illinois.*

Mr. President and Fellow Farmers: It seems to me you have heard about all you may care to hear on this phosphate and limestone question and I will promise to not keep you long.

The experiments I have carried out or, rather, the plan I have adopted, has been largely on an eighty acre farm. We began applying phosphate in 1908 at the rate of 1,300 pounds per acre. I applied it all over the cultivated land of this eighty at that time, about 20 acres was in blue grass pasture. In the first place we are not troubled greatly with stiff sub-soil in our locality. W have what might be considered good corn belt land. We need drainage, of course, and the larger part of the land in this locality is fairly well tiled. We also had a good supply of native fertility to start with, but it has been cultivated for perhaps 65 or 70 years, and very many of the farms, in fact all of them, that have not been treated in some manner by using phosphate or lime or growing sweet clover, are beginning to show a great deal of deterioration.

In 1908 we put 40 tons of rock phosphate on 60 acres. In 1914 over this same land we put on another 40 tons, and in 1921 we put 35 tons on 30 acres. Of course I am not yet expecting much result from this latter application. In 1910 I put on two tons of limestone per acre.

This farm, when we bought it, had been rented under the robber system usually practiced in Illinois and other states, and a great deal of it was infested with cockle burrs and other noxious weeds, and did not produce very well, but for the last six years it has averaged 80 bushels of corn per acre and has produced several 80 bushel crops of oats, with an average above 70 bushels per acre. We have been growing sweet clover since 1912 and find it a very valuable adjunct to the corn crop, or any other crop we grow.

I would not farm if I could not grow sweet clover, because that is one of the best crops we have. Of course, we don't have the problems that they have in southern Illinois. In 1908 phosphate cost $6.90 per ton. In 1914 we paid $7.50 per ton; in 1918 $8.50 per ton. In all we have expended $18.46 per acre besides the hauling. My home is something over a mile from the station so that our problem of hauling has been very much less than it would be to many farmers. For us it cost about 75 cents per ton, but counting the cash outlay alone it amounts to $18.40 per acre for both the lime and the phosphate, in these applications.

As to the corn crop this year in that locality: the larger number of the farmers have used more or less limestone and some have used phosphate. The crop this year will not exceed 40 bushels per acre on the average; but if I gain 35 bushels per acre this year and counting the corn at $1.00 per bushel, I would have within a very few cents of twice as much money per acre for this crop alone, as was put into both lime and phosphate in all the applications made. On the other hand, I attribute part of that to the sweet clover; in fact, a good deal of it. I have had in parts of the field over 100 bushels corn per acre.

Q. Could you have grown sweet clover with the lime and phosphate?

A. I think not, because where it is not applied they have trouble in growing clover of any kind.

A very large number of the farms are showing acidity by the soil test, but it is very hard to get farmers to believe that they ought to spend any money for building up the soils. Their fathers didn't do it. Of course, it takes a system of education to counteract the old theory to which so many of them adhere.

In regard to the sweet clover, on my oat field in 1924 sweet clover was sowed in April; I cut over two tons of sweet clover hay per acre after the oats was taken off this first fall after the seeding last spring. Of course, I have always gotten pasture the first fall after seeding but never cut it before for hay. Being rather short of hay last fall, and there was such an immense crop I concluded to cut some of it this year.

This was a year when a good corn crop paid. If you can raise 35 or 40 bushels more on the treated land than on the untreated, it appeals to the farmers as a good practice.

Soon after I began using sulphate and lime we bought another 80 acres of land and applied limestone on that, but have never put any phosphate on it. One fall we turned under a crop of sweet clover that was sown in the spring before and sowed it to wheat. We sometimes hear that is not a

very good thing to do, that we can not keep the clover down. In this case the clover bothered us but very little but the man did an excellent job of plowing. In fact, he put an extra point on the outer end of the plow lathe with a little curve to it so that the plants would all be cut. We harvested 47 bushels of wheat per acre from this, and that was 10 bushels per acre more than any other farmer had in our threshing run. The following year it was put to wheat again and raised 37 bushels per acre when the crop was not over 25 bushels to the acre on the average on that locality.

Q. Do you have any trouble with your grain lodging?

A. I never have. Of course, I can see where that could sometimes happen, but sweet clover helps to hold it up.

Q. Do you get the desired results when you plow under green sweet clover in the fall?

A. Well, no, I really don't favor that plan for the reason that as soon as you plow under a green crop, decomposition begins and you lose much nitrogen that you should have in the crop in the spring. Decomposition is especially rapid in sweet clover when turned under green and weather is warm and moist. This spring I expect to plow 25 acres seed in in the spring of 1924 and put it to corn.

Q. How long would you let your sweet clover grow before you plow it under?

A. I usually wait until the second year. I have always followed a system of rotation, as follows: oats, seed to sweet clover, the following year use for pasture or cut for hay. The great trouble I have is to have enough stock to keep the clover down when pasturing.

Q. How tall do you let it get or do you plow it under as soon as possible?

A. It is pretty hard to put a fixed rule on that, because your sweet or red clover will take up the moisture from the soil very rapidly, and secondly, there is a possibility the plowing may be delayed so long, that the moisture content is so depleted that planning may be difficult. I would not plow it under until it was six to ten inches in heighth and then be prepared so that you can plow it quickly. Get your other work up as well as you can and plow it under and work it down just as quick as possible with the idea of retaining the moisture. A summer like this last summer will not give you any cause for worry.

I am inclined to think, while I have cut it for seed many times myself, that we not grow seed in our locality with as much certainty of securing profitable yields as in Minnesota and other places where they have less moisture in the fall. We do not have the weather that is favorable for the proper production of seed, I think that it is not the thing that we should strive most for in the sweet clover crop.

Q. Can you cut sweet clover for seed successfully with a binder?

A. I am inclined to think that you lose too much of the seed by cutting with the binder by the old method. I believe that the new process is better as they are doing in some localities, where they do not cut the clover at all, but speed the reel up to about one hundred revolutions per minute. With a sloping canvas at the back ground to catch the seed and allow it to fall on the platform, in a box at the foot of the canvas and not using any working parts of the binder except your reel, simply reinforcing the guard bar in such a way that it can ride right over the standing clover as the reel beats the seed back.

The greatest objection I find in using the side rake machine for cutting is in getting it through the thresher afterward. You can do it but you lose a great amount of the seed when you thresh it and it is a tedious job. We use a tarpaulin on our racks. We begin loading at the rear of the rack, loading to the height of 5 or 6 feet and avoid tramping and loading it outside the limits of the rack. It must be taken from the ground and loaded very carefully. Then it is a hard proposition to get it through the machine. The average clover huller hopper won't handle it. We usually run it through a grain separator and then through the huller afterwards, but that is quite expensive.

I do not know that I could say anything more on this subject that might be of value but would like to emphasize the fact that we got more out of this last year's corn crop above the average in that locality to more than pay for all of the limestone and phosphate we put on altogether, besides getting the increased crops for all the years previous.

Q. Has the phosphate enabled you to grow sweet clover on land that has not been limed?

A. I would say in answer that the best way is to test your soil for acidity. There are a number of our farmers who walk out over their clover fields, unable to decide whether to leave it or plow it up. It should be a good clover crop or none at all. The expense for testing soil as to acidity is so small that a farmer cannot afford to raise the expense of seeding without first testing the soil. If it needs limestone, put it on, because it will re-pay a hundred fold in a few years. I don't want to farm without sweet clover. I thank you. [Applause.]

PRESIDENT ALLEN: I think the farmer's experience is the best proof of the worth of the Illinois System of Permanent Agriculture. I will now ask Mr. Schoeffer to say a few words.

SOIL BUILDING PAYS.

MARTIN H. SCHOEFFER, *Washington County, Illinois.*

MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: To tell the truth, I feel out of place after hearing several of these splendid speakers who have had a lot more experience than I have had. I am living over in Washington County, a county without a farm advisor, and it seems like the Washington County farmers are getting things off hand from the others. In other words, I am expected to go to this meeting to hear what the other farmers have to say about their results and then take that knowledge home with me as I have been doing for the last five years.

Martin H. Schoeffer.

Mr. Young insisted that I come here and tell what we are doing down in Washington County. I tried to make several excuses, but all he said was that he had made reservations for me at the Hotel France in Paris. I have taught school for four years, but I always taught my children that Paris was in France. I told him I would talk, provided I could, on the life of Dr. Hopkins and the results we obtained through his work rather than my own experiences, because we are just starting in on our second rotation.

In 1912, as I remember, Dr. Hopkins was over at the Farmers' Institute at Centralia. There several of the Washington County people heard him for the first time. They later secured Dr. Hopkins to speak at our County Institute at Nashville, and out of the number who heard him there were some that took the idea home and put it into practice in spite of all the laughing and of all the fun and jokes that were told about them. Now those people had success. The others just seemed to talk about it and did just exactly like the hired hand with the geese. You undoubtedly know the story about the farmer who, before going to town, told the hired man to do the chores, and the farmer's wife told him to be sure and take care of her geese. Well, he did as told him, but when it came to feeding the geese he didn't know what to feed them. So he pitched down a fork of hay and the geese started to make some noise. So night came on and the farmer came home and he asked the hired man whether he had milked the cows and had done the chores. He said he had. Then the wife asked the hired hand whether he had fed the geese, and he said "yes". "Well, what

did you feed them" she asked. "Well", he said, "I was in the loft and I threw them down a fork of hay." So the farmer asked him whether they ate and he said, "Well, Boss, I don't know but they were talking about it."

That same thing was true down there. They were talking about it and not taking action until 1913 and 1914. Professor Logan of the University of Illinois, working for the Experiment Station, made a canvass of the county and introduced limestone to the farmers, and for the first time we got one-third of a car. My father did not risk a car, but he bought a third of one. That was our first lime application, made in the fall of 1913. Mr. Logan did wonderfully well, selling large quantities of limestone. Previous to this time very little had been used in our county.

In the year 1914 it was again tried and a number of farmers failed to get results; the clover dried out and they didn't have a crop, and some of them got to thinking that after all it was not the thing, but the original fellows kept hard at work. They were getting 30 bushels of wheat to the acre where the others were getting 7 and 8 and 9, and occasionally 10 bushels. They had been raising wheat 4, 5 and 6 years in succession, without rotation. Once in a while they would slip in a crop of oats. You all know that Washington County is a great wheat county, but we have overdone it, that is all; we have raised too much wheat. If we had raised something else we would have been better off today.

Then for several years there was very little limestone used. They saw the results the other farmers were getting and some gradually woke up to the fact that they better try it again. They were getting their limestone from Menard, from the state penitentiary, but the railroad went bankrupt along about 1918 and they couldn't get any limestone for a couple of years. The people then wanted limestone, but they couldn't get it. Then it was too late, and they saw where they had made their mistake; they were sorry, but that didn't help. So in the course of about a year and a half a new company was organized and started to do business and then again came in a stream of limestone.

Limestone cars being unloaded from the Schoeffer farm switch.

It is said of one farmer that he wouldn't have any limestone on the farm if they hauled it there for nothing. Now he hauls three and four cars a year. However, several of the farmers got together and they gave the railroad company a strip of land to put in a spur in two different places in our county. We have one on our own farm and we are getting limestone now. This switch on our farm is patronized by about fifteen farmers. We have unloaded over 1,400 tons of limestone in two years and have twenty cars on order for 1925. It is a serious question whether we can get it. On the other hand, take Hoyleton for instance, you can hardly see it on the map, and they received over 80 car loads last fall, which was only 60 per cent of the limestone that the farmers had ordered. Less than 60 per cent of the orders were filled.

Last year one of the pioneers of the system had eight acres, and what do you think he raised? Forty-four bushels of wheat per acre. Now, that was better wheat than he had ever raised and much better than he ever expected to raise. The result was apparent, and the farmers are now more interested in limestone than ever before. In other parts of our county they are not using limestone as they should.

RESULTS ON DU BOIS EXPERIMENT FIELD.

On the DuBois Experiment Field in our county the University Experiment Station has conducted twelve years of field tests which show the value of soil fertilization under the Hopkins system. The soil on this experiment station field is the gray silt loam on tight clay which is very common type of soil in Washington County. The soil treatment has included the use of lime and crop residues, lime and phosphorus, lime and potassium, the crop residues being used with each of the fertilizers and with the various combinations. The results as shown in crop yields have been very striking, especially when the value of the crops per acre over the entire twelve year period are considered. Check plots receiving no soil treatment whatever have, of course, been maintained in the field, which gives the basis of comparison with all the plots to which fertilizers have been applied. It is interesting to note these results as given by the Experiment Station in their soil reports. Briefly they may be summarized as follows:

The value of the twelve crops on the untreated land amounted to only $58.02, whereas the value of the increase produced by lime and phosphorus was $68.58. The use of lime and phosphorus has resulted in an increase greater than the crop produced by the unaided land. Raising the crop values from $58.02 to $126.60, counting corn at 35 cents a bushel, oats at 30 cents, wheat at 70 cents, hay at $6.00 a ton, clover seed at $6.00 a bushel, and soybeans at $1.00 a bushel. These prices are below the ten-year average. In addition to the increase in crop yields, a very marked improvement in quality of the crops has also been noted.

The results on this experiment station field in Washington County for a period of twelve years show a crop value of only $58.02 for the unfertilized land, and an increased value for the use of lime alone $26.12, or 45 per cent increase; for nitrogen and organic matter over lime $20.41, or 24 per cent increase; for phosphorus as a further addition $52.03, or 50 per cent increase; for potassium as a final addition $24.63, or 16 per cent increase. The total increase in crop value over the untreated land for these twelve years was $123.19, or 212 per cent.

What better results can a farmer want, and where can any one find an investment which will prove as profitable as in the proper fertilization of this common type of soil of which Washington and other southern Illinois counties have so many acres.

There is one thing that I am sorry about and that is that the Hopkins Memorial Association has not been able to raise the money to buy Poorland Farm. I visited that farm and on the check strip I counted seven or eight shocks of wheat, you could hardly see them, and on the treated strip, they were so thick I could hardly count them, but as I remember I counted 47 or 48 shocks on the strip that was treated with lime, phosphate and manure. I don't think we have any better demonstration farm in the United States, and I do feel that it would mean a great deal for us if we could get this project over and save for the future on this great farm.

I have come to the conclusion that with the proper amount of calcium applied in the form of limestone and raising clover to get the humus, we will be in first class shape for production. Humus is one thing that our soil needs very much. We find that we have enough potassium in the soil if we only get the humus in the soil to liberate it. Phosphate is very limiting and must be supplied, of course, there are always some farmers who don't get results, but that is due to the fact that they don't make proper application. The system of most of the farmers is faulty. Some of them put these applications on the stubble and then put the clover on top of that and expect wonders to happen. Others again don't apply anything.

Now, gentlemen, we have come to this conclusion on our own farm and that is, that the system as we have used it has brought us in, in the four or

five years, ten dollars. That is to say, for every dollar invested in limestone it has brought back about ten dollars in profits, when followed with clover, preferable sweet clover.

One mistake that we have made throughout the county as a whole is that the farmers have not inoculated their clover; they have not raised sweet clover, and it was only until this spring that several hundred bushels were sown in our community.

Last fall at the Farmers' Institute Professor Logan spoke to the farmers about it although some twelve or thirteen years ago they looked at him skeptical; some thought he was trying to slip something over, but now they extended him their hands for selling them limestone. He also told them of the advantage of sweet clover, and you can't imagine the success we had throughout the last Institute in getting the farmers to use sweet clover and soy beans and the like.

I think we will have more legumes out this spring than we had the last five or six years combined, if we can only get sufficient limestone. Phosphate is not used to any extent, but about 10 cars will be used next fall.

In conclusion let me say that I am confident that in the future Washington County will come along with the other counties and the Farmers' Institute, if it will carry on as it has done in Washington County, will carry it to every part of the county. I am confident also and I hope that in the future we will have a Farm Advisor like most of the other counties are enjoying because you don't imagine what a disadvantage we are having in our county. The only thing that we do get there is through the school and through the Institute. The Institute is the sole factor, practically to bring about this work which Mr. Hopkins started and we are not going to let it die down. I hope sincerely that everyone will go to work and help try to save for us Poorland farm. I thank you. [Applause.]

WEDNESDAY AFTERNOON SESSION.

February 18, 1925, 1:30 o'Clock P. M.

RALPH ALLEN, *President, Illinois Farmers, Institute,* Presiding.

PRESIDENT ALLEN: The first number on the program will be a song by the Kansas Quartet.

Music.....Messrs. Delap, McAdams, Morris, Boyer

PRESIDENT ALLEN: Our first speaker this afternoon will be Dean H. W. Mumford of the University of Illinois, who will speak to us on the subject of "The Morrow Plots."

THE MORROW PLOTS.

DEAN H. W. MUMFORD, *University of Illinois.*

MR. PRESIDENT AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: I always dislike to have a program changed on my account, but I think an explanation is due me at least, if not you. I received a telegram from President Kinley of the University this morning saying that a subcommittee of the Appropriations Committee from Springfield will be at the University tonight and President Kinley requested that I be there to represent agriculture, and I am obliged to leave early this afternoon in order to get home. I want to say this because it is a disappointment to me not to be able to spend a longer time with you here in this very interesting and valuable meeting.

Lest I forget it, I wish also to say in connection with this subject which I am about to discuss briefly with you, that there are half a dozen or more men at the University that could discuss this particular subject

as good if not more properly and more ably that I can discuss it, but it seemed to be the wish of the Institute authorities that I should discuss this subject.

Dean H. W. Mumford.

Before I begin I should like to read to you a newspaper extract that was published in the Prairie Farmer back in the year 1876, which will elicit somewhat the attitude of the farmers at that time concerning experiment station work at the University of Illinois. I am not sure whether the investigators referred to in this article referred to the Morrow plots or not.

"Prairie Farmer, July 15, 1876.

"Proposed Experiments At The Illinois Industrial University.

"Though I do not live in your state, please allow me to crave space in your columns to express my dissent as to the usefulness or practical bearing of the experiments which I notice it is proposed to try at the Illinois Industrial University or similar experiments elsewhere, on the agriculture of any of the United States.

"Lawes and Gilbert's tests were prolonged over many years, and were applied to a condition of things that are not likely to occur in this country, for the next half century most certainly and perhaps much longer even than that, if ever. "So widely extended are our areable lands, and so equal the price of their products, even when averaged for many years, that it is not at all probable that there can ever be any profit whatever in applying chemical manures in the manner proposed, to any farming lands in any of the western states, particularly for corn.

"The experience of John Johnson, of Geneva, New York, and other intelligent farmers, prolonged for forty or more years, has conclusively shown that by draining, the use of clover and grass and proper rotation of crops from one field to another, on the same farm, the land can be continually increased in fertility and productiveness, without any extra cost for buying manures, or applying them, or any increased farm labor. All that is required is intelligence and skill, to direct the ordinary labor of the farm.

"The five field course is usually the most approved system at the present time. A farm is divided into five equal portions, and some of these are put in grass, others in corn, wheat, barley, oats, or other small grain crops as the experience of the owner directs him. While one field is kept in grass for two, and occasionally more years, no other crop is repeated more than one season. Mr. Johnson has declared that by this course his land could actually be made too rich for wheat, though not for Indian corn.

"It is very much to be regretted that these agricultural college professors have such meagre and narrow views of their duties as applied to American agriculture. If they looked at home more, and stopped their periodical visits to Europe, conferring more with themselves and the leading farmers and agricultural editors of the country, they could certainly find enough to do without attempting any of the expensive and fruitless researches applicable, if at all, only to a far different state of affairs than those existing here now, or ever likely to exist, even in the eastern states.

"What root crops can be raised to withstand our severe winters, and alternate with corn, to give variety and relish to the diet of fattening animals, such as steers, sheep and hogs? What is the actual cost of feeding cattle on corn and corn fodder, or clover, or timothy hay? How many pounds of this sort of feed is required to put 100 pounds of flesh on a steer? What is the difference between feeding animals comfortably sheltered, and those exposed to winter storms, in actual dollars and cents? How many pigs can be profitably fed with cattle? How many cattle, properly sheltered, can one man feed? These, and many similar conundrums, can certainly

occupy the time of these theoretical teachers, without imitating European experiments. These are matters of every-day interest to farmers here, and through them, to the public generally."

I think I have explained to you why I read this paper, because it was the opinion, at least of a good many people at that early age, that such experiments, as we are about to discuss this afternoon, were useless, and that the time would never come when it would be necessary or even desirable to add anything to the soil other than the mere matter of properly following a system of crop rotation.

At the outset I wish to acknowledge the very great assistance rendered by members of the Experiment Station staff, particularly in the Agronomy Department, without whose assistance it would have been impossible for me to present this paper.

HISTORY OF MORROW PLOTS.

The Morrow Plots were named after Professor George E. Morrow who was Professor of Agriculture at the University of Illinois from 1878 to 1894. They consisted of three half acre plots located on the south campus of the University of Illinois, upon which were started three cropping systems. Plot 3 was to be devoted to continuous corn without soil treatment of any kind; Plot 4 a two-year rotation of corn and oats, and Plot 5 a three-year rotation of corn, oats and clover. In no case was artificial or commercial fertilizer of any kind to be used. These plans were later modified somewhat as will be subsequently explained.

The early history of the Morrow Plots, like the early history of many other enterprises is more or less obscure. In the first place, we have been unable to date to determine the precise date upon which these plots were started. On page 327 of Bulletin 125 of the Illinois Agricultural Experiment Station under the authorship of Dr. Hopkins, the assertion is made that the Morrow Plots were originally laid out in the year 1879. Dr. Hopkins undoubtedly relied upon the Biennial Report of the Board of Trustees for 1879-80, on pages 203 and 332 of which reference was made to the Morrow Plots. There has recently come to the attention of the Agronomy Department, however, an earlier reference to what seems to be this same series of plots, in Experiment Station Bulletin No. 8 signed by Thomas F. Hunt. This bulletin reports the work for 1889 and in it the following statement appears under the caption Experiment No. 23, page 266, "Briefly, ten half-acre plats 5 x 16 rods have been cropped during the past fourteen years as follows." Further down the page reference is made to corn being raised continuously for fourteen years. Fourteen years previous to 1889 would set the beginning of the experiment back to the year 1875 and thus make

Fig. 1.—Dr. Hopkins on Morrow Plot No. 4 in July, 1905.

these plots four years older than we had hitherto supposed. In order to get some light upon this discrepancy Dr. L. H. Smith wrote to Dr. Thomas F. Hunt, formerly connected with the Agricultural Experiment Station at this early date, for any light he might throw upon the subject. Dr. Hunt replied as follows:

> "Without stopping to look into the matter, I hasten to reply that I feel confident on general principles that the plats were laid out some years before 1879. I was foreman of the Farm in the spring of 1881, which may be verified by looking at the list of officers in the catalog of that year, hence I would have been quite keen at that time concerning these plats which were much discussed. I think, therefore, that there is reason to assume that the statement which I made was correct, although, of course, I have no means of verifying at the moment.
>
> "I am wondering whether the files of the Breeders' Gazette between the years 1875 and 1880 might not throw some further light on this subject. I recall that Professor Morrow wrote rather continuously for this Journal for a number of years. It might easily be that during that time he made some reference to the organization and laying out of these plats."

Dr. Smith comments that:

> "We have been unable up to the present time to find any satisfactory evidence from the agricultural press of that day as suggested by Dr. Hunt. The most reasonable explanation for the discrepancy in dates that we can think of is to assume that the rotations may have been actually begun in 1875, and the action of the Board of Trustees some five years later was merely a measure taken officially authorizing the work."

This is the best information we can give to date as to the earliest history of the plots. However, we are still hoping to find more definite facts.

Definite records of the yields from the various plots date from the year 1888 when the continuous corn plot yielded 54.3 bushels per acre, whereas in the two year rotation of corn and oats the corn yielded at the rate of 49.5 bushels per acre. In the three year rotation this was the year

Fig. 2.—Morrow Plots 3 and 4 in August, 1924.

for oats, and the yield was at the rate of 48.6 bushels per acre. It would appear from the subsequent yields that this must have been a very favorable year for corn production because as large a production of corn on the continuous plot was not recorded again for eight years and the yield has been exceeded on the continuous corn plot without fertilizer only twice in the entire thirty-seven years.

The land upon which these plots were located is typical of Central Illinois prairie soil. It is naturally well supplied with organic matter and nitrogen. It was believed that these constituents, namely, organic matter and nitrogen, did not need to be increased as to total amount, but that they

should be maintained. With such soils, authorities believe that the condition or character of the organic matter is of more importance than the total amount which is usually adequate. As the organic matter lies in the soil year after year, it becomes more resistant to bacterial decay, hence less active or capable of easy decomposition.

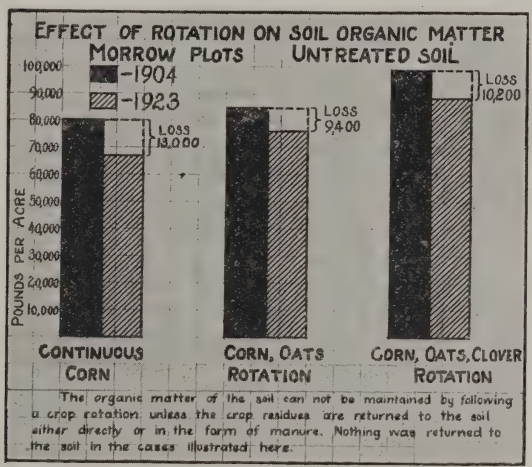


Chart I.

Some idea of the relative productiveness of these plots in their earlier years may be gained by comparing their average yields from 1888 to 1904 with the average yields of the same crops for years within the same periods as reported by the United States Census, for Champaign County, Illinois and the United States. These yields are as follows:

	Corn, Bushels per acre.	Oats, Bushels per acre.	Clover, Tons per acre.
United States, 1879	28.1	10.8	1.15*
United States, 1889	29.4	13.1	1.26*
United States, 1899	28.1	12.4	1.30
Illinois, 1879	36.1	16.2	1.33*
Illinois, 1889	36.8	15.9	1.39*
Illinois, 1899	38.8	14.0	1.20
Champaign County, 1879	38.5	37.7	1.09*
Champaign County, 1889	36.1	40.2	1.47*
Champaign County, 1899	49.5	44.2	1.26
Morrow Plots, 1889-1904, average			
Continuous corn	39.7	....	....
Corn and oats rotation	41.0	44.0	....
Corn, oats, clover rotation	48.0	47.6	2.03

* Includes all kinds of clover.

It is evident even at this early period that the yield on the continuous corn plot was showing the effects of continuous cropping.

No fertilizer of any kind was applied up to 1904. In 1904 each half acre plot was reduced in size and divided east and west into two equal strips. The north half continued to be cropped without fertilizer, while the south half in each instance was given an application of manure, limestone and phosphate.

SOIL HANDLING METHODS.

The north halves of the plots have been cropped in the respective rotations, removing all grain, straw, stalks and hay. Residues have not been returned either directly or in manure.

On the south half of Plot 3, in continuous corn, the stalks and grain have been harvested, and the equivalent amount of manure returned to the respective east and west ends. For some years, legume clover crops were seeded in the corn at the last cultivation, but the failures were so general that the practice was discontinued.

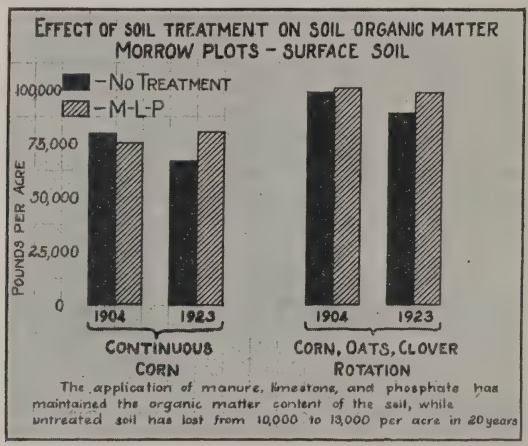


Chart II.

On the south half of Plot 4, in corn and oats rotation, the grain, straw and stalks of both crops were removed and the equivalent amount of manure returned, that is, the amount which could reasonably be expected to be produced by using the produce of the plot as feed and bedding, as explained in the paragraph on Manure Applications. In addition, beginning in 1912, catch crops were grown, being seeded in the oats and plowed down the following spring for corn. In 1912 this was a clover mixture, containing some sweet clover; in 1914, sweet clover 15 pounds and alsike 5 pounds per acre. The crop was mainly alsike. In 1916 a sweet clover and red clover mixture was seeded, red clover predominating in the crop plowed

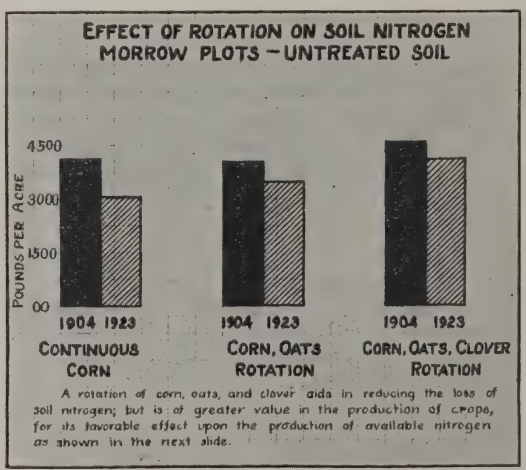


Chart. III.

under the following spring. Since 1916 sweet clover alone has been used, and satisfactory growth has been secured in practically all cases.

In the three year rotation, stalks, straw and grain were removed as well as clover hay, and manure returned as noted above. There is no place in this rotation for a catch crop, the clover sod being plowed down for corn.

PLAN OF FERTILIZER APPLICATIONS.

Manure has been applied to the south half of these plots since 1904. Until 1909 the applications were at the rate of 2 tons per acre per year; since 1909 all manure applications have been in direct proportion to the crops removed from the respective plots (manure equal in weight to the air dry weight of the crops removed). In all cases, the manure is applied on each plot ahead of the corn crop, hence, manure is applied annually on Plot 3, once in 2 years on Plot 4, and once in 3 years on Plot 5. The total amounts applied to the respective plots since 1904 are as follows:

MANURE.

	Tons per acre.					
	Plot 3.		Plot 4.		Plot 5.	
	SW.	SE.	SW.	SE.	SW.	SE.
Total, 1904-1924, inclusive.....	62.4	67.5	62.1	67.4	57.4	59.6
Average amount per annum.....	3.12	3.37	3.1	3.37	2.87	2.98

LIMESTONE.

In 1904, 1704 pounds per acre of ground limestone was applied to the south half of these plots and in 1919 a further application of five tons per acre made. The total limestone application to each of the treated plots in 20 years is thus 5.85 tons, which would cost, at average prices, approximately $2.00 per ton or $11.70. The average annual acre cost is $.58.

PHOSPHATE.

From 1904 until 1918, bone meal was applied to the southeast one-fourth of the plots at the rate of 200 pounds per acre per year. In 1919, the annual acre rate was changed to 50 pounds. Rock phosphate was applied to the southwest one-fourth of the plots in the ratio of 3 pounds of phos-

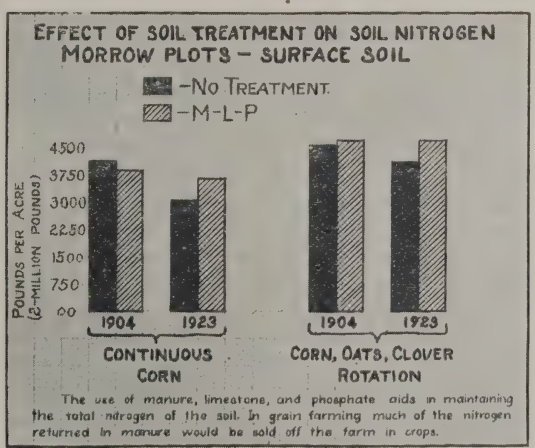


Chart IV.

phate to one pound of bone meal, or at the annual acre rate of 600 pounds. In 1919, the ratio was changed to 4 to 1 and enough additional phosphate was applied to bring the total application up to 4 times that of the total amount of bone meal which has been applied and subsequent applications of phosphate will be in that ratio or 200 per acre per year.

Prior to 1918, the phosphates were applied on Plots 3 and 4 once in two years ahead of the year in which corn appeared on Plot 4, and on Plot 5 ahead of the corn crop, or once in three years. In 1918 it was decided to apply the phosphates on all three plots once in six years, ahead of the corn crop appearing simultaneously on all plots.

The total rock phosphate application in 20 years, to the southwest quarters is 13,200 pounds per acre. That at $10.00 a ton, an average price for

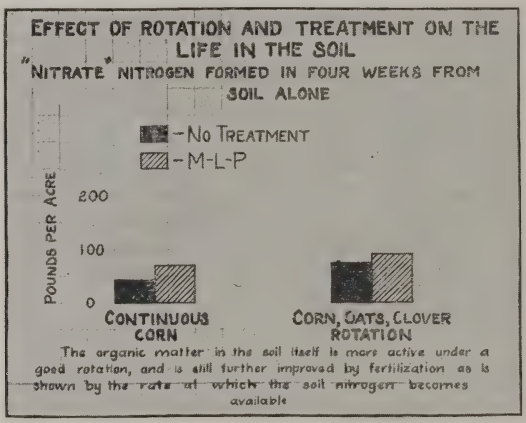


Chart V.

the past decade would cost $66.00 or an average annual acre cost of $3.30. The bone meal application, 3,300 pounds per acre for the 20 years, at $40.00 per ton, an average price, would cost the same per acre as the rock phosphate. The comparative profitableness of the different treatments and rotations is covered in the discussion on relative net land values and cost of production. (Chart Nos. 15 and 16.)

A little later we shall show by slides some of the chemical and biological changes which have taken place on the soil of the various plots. As to physical character no measurements of changes have been made. The plan of the experiment makes it impossible to make more than very limited investigations in this direction. The plan of the experiment also precludes measurement of labor requirement on the respective plots. We cannot give an answer to this question that we are certain is correct.

The following observations throw some light upon the effects which have been produced by different methods of soil management. On untreated continuous corn land, the limiting factor is most probably lack of available plant food elements. This is indicated by the fact that M-L-P on the south half has increased the yield by 15 bushels annually as an average for the last twenty years. The 40.5 bushel yield on the treated half is still limited by something. This, so far as we can determine, is the lack of the "vitalizing" influence of legumes. It may be in part available nitrogen and in part biological or physical shortcomings.

The influences of the legume crop are distinctly shown in both the two-year and three-year rotations. This is particularly marked in the two-year rotation, which had no legume crop for the first ten years when it was otherwise fertilized. The corn during this ten year period averaged 53.7 bushels per acre. Since 1914 sweet clover has been seeded in the oats and plowed down for corn, and during this last ten years the average corn yield has been 68.7 bushels, an increase of 15.0 bushels.

On the fertilized halves of the two and three-year rotation plots, the yields are approaching the point at which climate is the limiting factor, but probably have not quite reached this point.

One of the interesting questions that may be asked of the Morrow Plots is "Has there been a noticeable difference in the grade or quality of

the product produced on the different plots?" One index of the quality of the corn produced on the different plots is the moisture content of the corn at husking time, indicating relative maturity. The moisture content of the corn and the ratio of shelled corn to ear corn have been determined and the following data are for the 1923 crop:

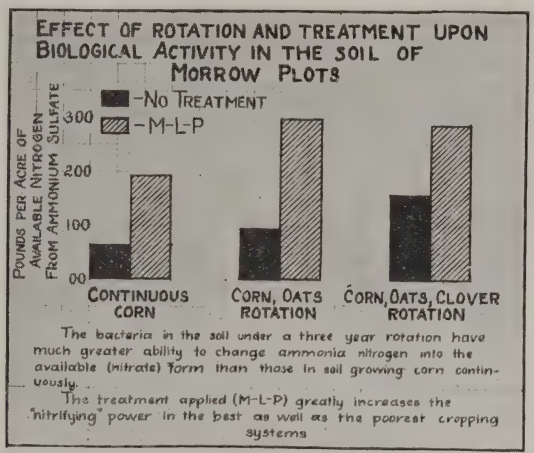


Chart VI.

	Per cent of water-free shelled corn from ear corn at husking time.	Field weight of ear corn at husking time required to make one bushel of No. 1 shelled corn.
Continuous corn—no treatment	58.7%	84
Corn, oats rotation—no treatment	60.2%	81
Continuous corn—treated	61.3%	80
Corn, oats rotation—treated	62.1%	78

Where fertilizer has been applied the only apparent differences in behavior of the halves of the plots traceable to the rotations practiced are those of crop yields. These differences are brought out in several of the charts prepared, such as those showing the trends of annual crop values. (Charts Nos. 9 to 14.)

The following table from Chart 9 will emphasize this point:

TREND FROM 1904 TO 1924.

Continuous corn	$26.52	$33.44
2-year rotation	31.40	39.75
3-year rotation	36.87	43.90

These figures clearly show that with similar soil treatment, better rotations have an increasing influence on the value of the crops produced.

In order to interpret somewhat the results of the work on the Morrow Plots in terms of farm practice in Illinois it may be well to consider briefly the question of the proportion of Illinois crop land farmed under a good system of crop rotation. According to the 1920 census report, there was 21,017,929 acres of land in crops during 1919. Of this land, 37.6 per cent was in corn, 20.4 per cent in oats, 19.5 per cent in wheat, 2.4 per cent in barley and rye, 13.9 per cent in non-legume forage, and 5.2 per cent in legumes classified and counts the timothy-clover acreage as one-half legumes. If these crops, in the proportions mentioned, were arranged for a rotation it would take approximately nineteen years to complete it. Seven of these years would be corn, four oats, four wheat, two non-legume forage, and one

legumes. Assuming that this proportion of legumes was used in a three-year rotation, in the order of corn—oats—clover, only about 15 per cent of the crop land of the state would be managed with such a rotation. Assuming that the legumes were grown in a four-year rotation, then the proportion of Illinois crop land growing such a rotation would be upwards of 20 per cent.

In Champaign County, the proportion would not be so large. The 2.4 per cent of legumes in this county would maintain only about 7 per cent

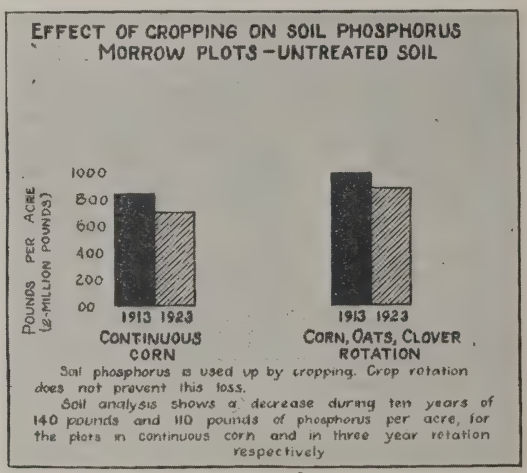


Chart VII.

of the crop acres in a 3-year rotation or 9 per cent in a 4-year rotation.

This would show that at best in the state as a whole not over 10 per cent of the land is under a system of farming as good as that followed in the three-year rotation on the Morrow Plots, namely, corn, oats and clover. Let us now ask ourselves if, even under such a system of farming or under a system presumably practiced by not to exceed ten per cent of the farmers of Illinois, we are maintaining the fertility of our lands.

As revealed by the Morrow Plots the chief objection to a three-year rotation without soil treatment is waning fertility. The loss in productive power is not so rapid as in the other rotations, but it is plainly evident. This is clearly brought out in Chart 1 showing the trend of annual crop values for the period 1888-1924. The trend value in 1888 is $30.76, while that for 1924 is only $25.78.

The chief disadvantage of such a system of soil management is due to the gradual impoverishment of the soil without provision for replenishment. Acidity probably gradually develops and with increasing intensity, interferes with the normal growth of clover. Available plant nutrients are gradually exhausted. The physical, chemical and biological factors best suited for normal plant growth gradually get out of balance and thus influence plant growth unfavorably. A return of a part of the clover crop at least would undoubtedly be of great benefit to the soil.

Charts 1 to 8 illustrate the effects upon the soil itself of crop rotation and fertilization with limestone, phosphate and manure, as revealed by chemical analysis of the soil. The analyses represent the surface seven inches of soil only. It is approximately the stratum turned by the plow. It is also the only portion noticeably affected by applied fertilizing materials, but is by no means the depth drawn upon by the feeding roots of crop plants.

No one of the three cropping systems on the Morrow Plots has maintained the total organic matter of the soil without soil treatment. Chart

1 shows that the destruction of organic matter has been most rapid in the continuous corn plot, namely, 13,000 pounds in twenty years. The two rotations have lost about equal amounts of organic matter, 9,400 and 10,200 pounds for the two and three year rotations respectively.

The only treatment which has been applied to any of the Morrow Plots is manure, limestone and phosphate. Wherever this treatment has been

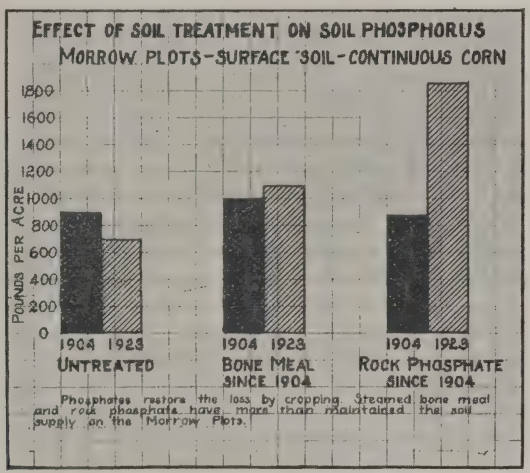


Chart VIII.

applied the depletion in organic matter of the soil noted in the preceding chart, has been either stopped or converted into a gain. In the continuous corn plot illustrated on the left of chart 2, the amount of organic matter has increased from 76,000 to 81,000 pounds per acre, a gain of 5,000 pounds in twenty years.

In the three-year rotation illustrated on the right, the amount of organic matter has undergone but little change, the amounts present being

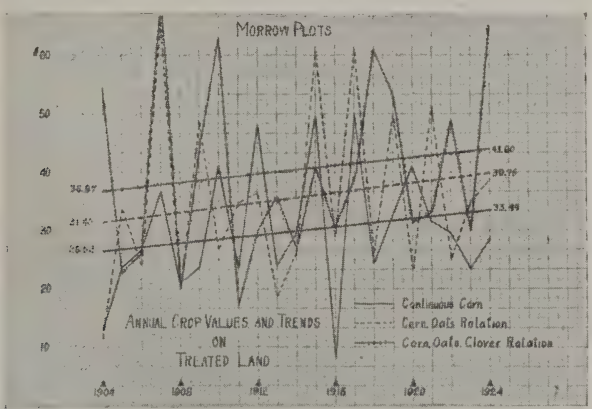


Chart IX.

101,000 and 99,000 pounds in 1904 and 1923 respectively. In both cases the treated soils contain more than the poorly managed soils to which nothing has been returned.

The case of nitrogen is quite similar to that of total organic matter. (Chart 3.) The soil of the continuous corn plot without treatment has suffered a loss of 1,070 pounds per acre during twenty years, or 25.7% of the amount present at the beginning of the period. The soil growing a two-year rotation of corn and oats, with all crops removed, has lost in the same time only 550 pounds, or 13.5% of the original amount in the surface soil, while the similar loss in the three-year rotation is 460 pounds or 10%. The treatment used has practically maintained the total nitrogen during the twenty-year period, as illustrated by Chart 4.

Of equal importance with the total supply of nitrogen is the activity of the organic matter containing the nitrogen, or in other words, the biological activity of the soil. This biological activity can be estimated with a fair degree of accuracy by determining the rate at which the soil, with its bacteria, can convert nitrogen into the nitrate, or available form from other forms, either from the organic nitrogen of the soil itself, or from added materials. Charts 5 and 6 illustrate the results of two experiments designed to measure the "nitrifying power" of the soil. In the first, the soil alone was kept for four weeks under favorable conditions of moisture and temperature and in the soil from the continuous corn plot there was found but 43 pounds of nitrogen in the nitrate form, as compared to 75 pounds in the soil from the three-year rotation plot. These are somewhat increased in the treated soil. This activity is accentuated if to the soil there is added a further quantity of nitrogen to be nitrified. This was done in the second experiment, sulfate of ammonia being added and the nitrate formation, as shown in Chart 6 was 64 pounds, 95 pounds and 160 pounds respectively in the continuous corn, the two-year and the three-year rotations, without soil treatment. The plots having received the manure-lime-

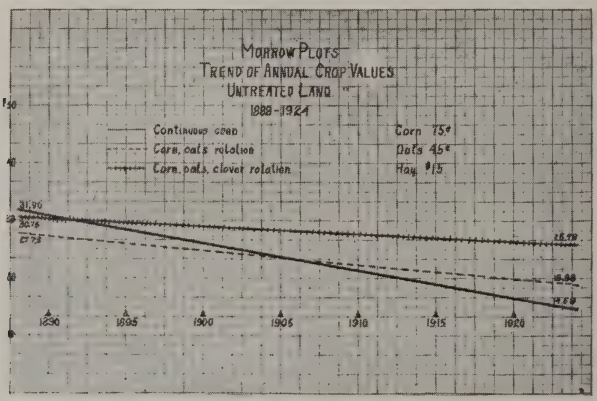


Chart. X.

stone-phosphate treatment supported still greater activity as shown by the formation of 193, 300 and 289 pounds of nitrate nitrogen for the same three respective cropping systems.

The two-year rotation appears slightly better than the three-year rotation. This is borne out by the crop yields, which, in the last ten years (since sweet clover was introduced as a green manure crop in the two-year rotation) have been slightly greater than in the three-year rotation.

Soil phosphorus is used in cropping. Crop rotation alone does not prevent this loss. (See Chart 7.) This loss is not large, and the equally large supply of phosphorus in the sub-surface layers makes the question of exhaustion of this element not an imminent one. A question of equal or greater importance is brought out in the fact that the phosphorus removed by crops is the more available portion, so that the phosphorus which

can become available readily is being exhausted much more rapidly than the total supply.

Bone meal and rock phosphate together with manure in the amounts used have more than maintained the soil phosphorus, regardless of the rotation followed, as Chart 8 shows. On other fields, where manure and crop residues have been used without minerals, the manure has been much more effective in making good the removals in crops harvested than have the crop residues. This is explained by the fact that phosphorus is concentrated in the grains rather than in straw or stalks, and when the grain is fed instead of being sold, from half to two-thirds of the phosphorus in the grain is returned to the soil in manure.

TRENDS.

In order to compare results on the three cropping systems, the yields of the different crops have been converted to the "common denominator" of money values, using for these values, corn $.75, oats $.45 and clover $15.00. Direct comparisons on a basis of yields are not possible because there are no multiple series to provide for growing each crop every year.

In Chart 9, the results from the three cropping systems are compared on the treated land. Not only are the returns greater in the two-crop sys-

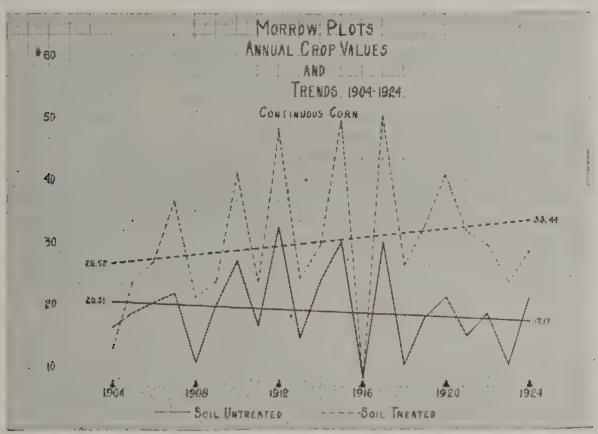


Chart XI.

tems than on continuous corn, and still greater in the three-year rotation, but these differences have been maintained consistently throughout the period. It is significant that in all three cropping systems, where the land is treated, the trends are upward.

When the untreated halves of these plots (Chart 10) are compared with respect to rotation effects, we observe a different result. At the beginning of the period, the continuous corn plot was producing the highest returns. Two factors are largely responsible for this. First, the land was not greatly exhausted by so long continuous cropping, so that yields were fair. Second, with these fair yields, and corn the more valuable of the two crops, being grown every year, the plot had the advantage of the two-year rotation plot, which grew a comparatively low priced oats crop every other year. At the close of the period under observation, the continuous corn plot occupies the lowest place. The lowered yields due to continuous cropping have more than offset the advantage which the continuous corn plot enjoyed at the beginning. Thus, the average annual crop values at the close of the period are, for the two-year rotation $4.19 higher than for continuous corn. The three-year rotation began higher than the two-year and has kept the lead according to the trend line. However, if only the yields in the last decade, since a sweet clover catch crop was introduced into the two year rotation,

be considered, this two-year rotation now has a slight advantage. This, however, is not sufficient to offset the advantage of the three-year rotation in the earlier years, hence the position of the trend lines.

This chart furnishes one answer to the question "What are the objections to a two or three-year rotation, without fertilization?" These rotations, alone, check, but do not prevent declining yields. The average, present production, annually, is for the continuous corn, $8.60 lower than twenty

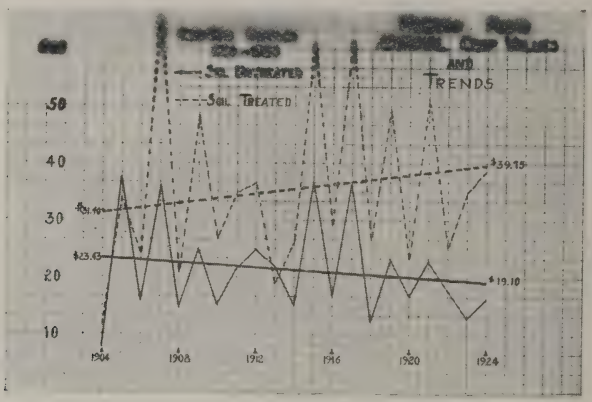


Chart XII.

years ago, at the price values used. In the two-year rotation the similar decline is $7.85 and for the three-year rotation, $4.98. If this continues, the land will eventually become unprofitable.

Charts 11, 12 and 13 all tell the same story. The treatment used has in all three crop rotation systems as compared to no-treatment.

(a) Maintained production at a significantly higher level;

(b) Converted a downward trend in production into an upward trend.

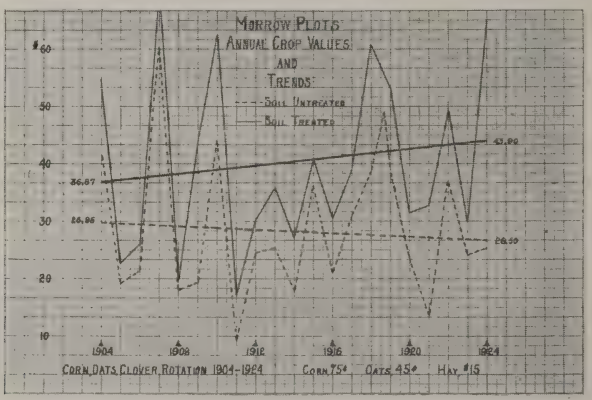


Chart XIII.

This gap in production between treated and untreated land, was widest at the beginning in the two-year rotation and narrowest in the continuous corn plot, and the same ranking of the cropping systems is observed at the end of the period. However, the difference in the effect of treatments in the different systems is not great. The gap in production between treated

and untreated soils has widened a little more rapidly in the two-year rotation than in the other two.

The corn yields, shown in Chart 14 for the continuous corn, and the corn-oats rotation, tell the same story as the crop values in the corresponding trend lines in Chart 10.

RELATIVE NET VALUES OF LAND.

The figures on Chart 15 represent the comparative relative net values of an acre of land under the various systems of soil management as practiced on the Morrow Plots. The factors used in calculating these values are general averages secured in part from farm management studies. The labor costs used were $8.00, $3.00 and $3.00 an acre for corn, oats and clover respectively. Harvesting and marketing costs were accounted for at the rate of 9 cents, 9 cents and $1.50 a bushel or ton for the respective crops. Soil depreciation or soil treatment costs were charged at the rate of 7 cents,

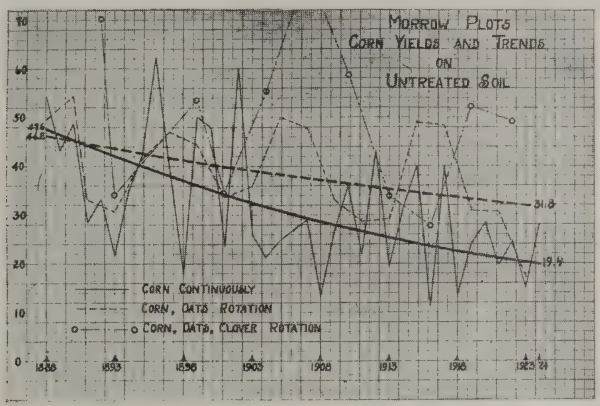


Chart XIV.

3 cents and $1.00 a bushel or ton for corn, oats, and clover hay respectively. Taxes at the rate of one per cent on the land valuation were allowed. The crops were valued at 75 cents, 45 cents and $15.00 a bushel or ton for corn, oats, and clover hay respectively. The net income was considered as the interest at five per cent resulting from the use of the land. The net value of the land is easily determined from this figure.

These valuations are interesting as a means of gauging the relative value of an acre of land in various systems of soil management. Whether they can be applied to farms practicing similar systems of soil management is not so clear. A farm growing corn continuously would undoubtedly have to have a different organization than a farm with a more diversified system. Such an organization might be more or less expensive. Then again these figures cannot account for differences in efficiency of different farmers. On the whole, however, they are interesting in that they point out an important relationship of diversification and soil treatment to the business of farming.

RELATIVE NET COST OF CROP PRODUCTION.

The values on Chart 16 were calculated from the same crop yields and for the same factors as used in calculating the net value of land. In this instance the land in all systems of soil management was assumed to have the same value, namely $200 an acre. As in the case of the land values, these unit costs of production should be considered relative.

These values also show an interesting relationship of diversification and soil treatment to the business of farming. Small acre yields are produced at a higher unit cost than larger yields. High acre yields may be produced at a cost below the market price, while low acre yields may not be.

Summarizing, it seems to be there are three main considerations or points of view in considering the results of the investigations carried out on the Morrow Plots. These are:

First: What has happened to the land?

Second: What would have happened to a farmer owning and operating the land where these systems of farming were followed?

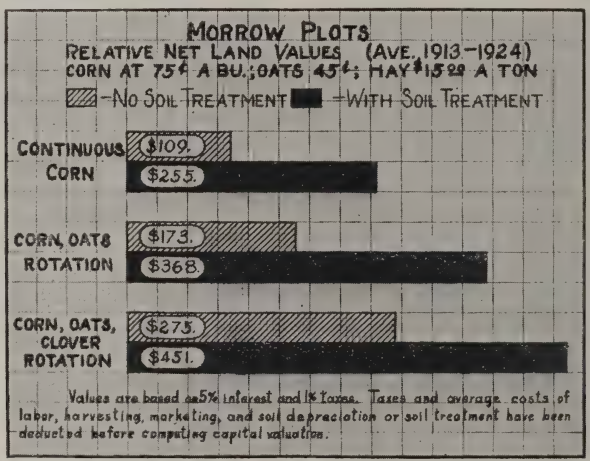


Chart XV.

Third: What bearing do these results have upon public welfare?

(a) Considering first the question of what has happened to land: we have a decline in yields on all untreated plots, particularly on the continuous corn and the corn and oats plots with a decidedly less decrease on the corn, oats and clover rotation plot.

(b) That the soil treatment used has increased the yields of crops in every instance more than enough to cover the cost of treatment and that the more rational the rotation followed the better it paid to treat the land.

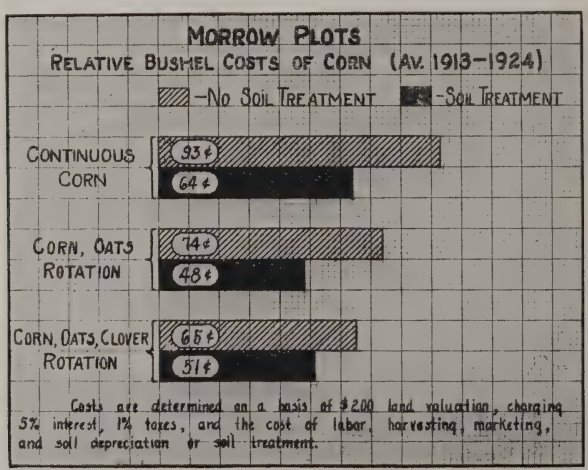


Chart XVI.

(c) That there has been a decrease in organic matter, nitrogen and phosphorus on all untreated plots, this decrease being more pronounced the more frequently corn was introduced into the cropping system.

Second: The significance of these results to the farmer who followed these systems would be:

(a) A material decrease in the income, noticeably smaller decrease on the corn, oats and clover system than the corn and oats or continuous corn plots where the land was untreated. So noticeable was this decrease that for the 38 years from 1888 to 1924 inclusive, there was an actual loss in cultivating the land either on a continuous corn or a corn and oats system. The corn, oats and clover ration untreated showed a slight profit.

(b) Where soil treatment was applied, the land not only yielded a profit but the land increased in value $55.00 per acre, in case of Plot 3; $168.00, in case of Plot 4 and $251.00 per acre in case of Plot 5 as measured by the potential crop value producing capacity of the soil. In case of the no-treatment continuous corn and corn and oats the land decreased in value as measured by the same standard.

(c) For the farmer following any one of these no-treatment systems but particularly the ones represented on Plots 3 and 4, it was found that as the yields showed a tendency to decrease the cost per bushel of grain increased.

(d) From the standpoint of farm management the farmer who grows continuous corn may care for 60 acres with his time, implements and horses not well used for half of the year. With corn and oats he might handle

MORROW PLOTS

TOTAL VALUE OF PRODUCTS

Acre Basis

1888-1924	Soil Treatment	37 Crops	Cost	+Gain or -Loss
Continuous Corn	None	$ 880.52	$1003.07	$-122.55
Corn & Oats	None	862.26	891.55	- 29.29
Corn, Oats & Clover	None	1046.14	732.49	+313.65
1904-1924	**Soil Treatment**	**21 Crops**	**Cost**	**+Gain or -Loss**
Continuous Corn	None	$ 404.09	569.31	-165.22
	MLP	629.64	691.71	- 62.07
Corn & Oats	None	446.59	497.15	- 50.56
	MLP	747.17	619.65	+127.52
Corn, Oats & Clover	None	589.53	466.13	+123.40
	MLP	841.48	585.53	+255.95

Chart XVII.

as much as 100 acres, while with a corn, oats and clover system he might handle satisfactorily as much as 120 acres.

The public should understand that not to exceed twenty-five per cent of the farmers of the state, and I believe fifteen per cent would be nearer, actually practice a system of farming either as to rotation or soil treatment, that is not certainly depleting the fertility of our lands and impoverishing the people who live by the land, by increasing the costs of production, while at the same time decreasing the possibility of keeping up the gross production.

The public interest in the maintenance of soil fertility is greater than that of the farmer. The public is interested in an adequate and cheap supply of food. This is not long possible on a waning fertility of the land.

Q. Do you take the stalks off the land where you have a continuous corn crop every year, or do you plow that under?

A. All corn stalks are removed.

I would like to take this opportunity to say that next summer all of these plots will be in corn again. This occurs but once in six years and

visitors will have a good opportunity to see the effects of the various systems of soil management upon the growing crop.

Now, gentlemen, I have only begun to touch the edges of what we can learn from a study of these Morrow plots this afternoon. I thank you. [Applause.]

PRESIDENT ALLEN: The next speaker on the program will be Mr. Frank I. Mann, whose subject will be, "Phosphate on Corn Quality."

PHOSPHATE ON CORN QUALITY.

FRANK I. MANN, *Iroquois County.*

MR. FRANK I. MANN: MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: Those plants which have the faculty of storing large amounts of food materials in and about their true seeds, constitute our most valuable crops, because they supply a large proportion of human nourishment in a direct or indirect form, and also compose the farmer's principal market crops. Because of the great variation in value of different lots of these various crops, the problem of quality is one of great importance to both producers and consumers.

F. I. Mann.

In considering quality of grains we should first determine the factors which constitute quality. For highest quality and greatest value, there must be the largest amount of food materials stored in the grain. This gives weight, and the market value of most of the grains is largely affected by their weight to a measured bulk. There is considerable difference in food value of wheat weighing 64 pounds per bushel and that weighing but 54 pounds.

Another factor in quality depends on these food materials being in a composition such as will permit of their being kept for long periods without material injury. The grains are harvested but once a year, and a supply must be stored to last a year or more. As plant sugars, these food materials cannot be long preserved without severe drying, because they readily decompose, and are liable to injury from bacteria and fungi which cause rots and molds. Accompanying the sugars, there is also a high water content in the grains which lowers their value and keeping qualities. When the food materials are largely stored in the grains as plant starches they are easily kept in storage, because in such case the moisture content is low and the starches are not so susceptible to attack of destructive organisms. Grains which are composed of a maximum of starches and a minimum of sugars, will also have a minimum of moisture, and may be kept in proper storage for long periods without serious injury.

Another factor in giving high quality to grains, is the viability, or life principles embodied in them. These are essential to the perpetuation of the species, and the development of a new generation. Not only must an active germ come forth from the grain, under environments for growth, but there should be developments of life activities to enable the new plant to perform its various functions of reproduction. A plant has many functions to perform in its reproductive capacity, and most of these functions are more or less dependent on the life principles involved in the seed, which develop in the action of enzymes. It is due to the enzyme activities that the young plant is able to use the food stored in the grain for it, as well as much of the other work it has to do in forming a numerous progeny. Not only are these life and enzyme activities important to the plant for its development, but they are also important in the digestive utilization of the grain as food for man and animals.

QUALITY DEPENDENT ON MATURITY.

These conditions of grain which give high quality are due to their maturity. Only when grains have reached a fully matured condition do they have the greatest amount of food value, which can be safely stored for long periods, and have the most nutritional value. Hence, we may say, that the term quality, as usually used, is dependent on maturity, whether such grains are to be used as food, to be stored or used for seed purposes.

What is maturity of grains? It is not easy to make a clear definition, nor to determine exact degrees of maturity. We might call maturity a completion of life processes of one generation, but it is often difficult to know whether such processes have been fully completed, or when arrested before completed. Perfect maturity is expressed by the grains in several ways. There is maximum weight; they are full and plump as well as heavy. In corn the spaces at cob are well filled, and the kernels are tight and solid and the cob is rigid; there is a maximum conversion of sugars to starches or to stable forms of sugars; there is a reduction in the moisture content until it may reach as low as 15 per cent, and perfectly matured corn may be as dry as commercial No. 2 grade, when taken from the stalk; there is a maximum movement of food materials from the plant to the grain, which can be approximated by the eye; there is a ready separation of the grain from the plant making a clean break of the grain from the plant; there develops a sheen, luster or brightness to the grain, which may be seen even in the hulls of small grain and in the cobs of corn, as well as the kernels. While these standards of maturity are more or less arbitrary and variable, they reach their maximum only with perfect maturity, and can be readily identified.

There are a number of causes, acting directly and indirectly, which tend to prevent maturity. Seasonal conditions, early frosts, seasonal habits of strains, inherent tendencies, insufficient nutrition, unbalanced supply of plant food elements, poor seed, improper farm methods, premature harvesting, drought, various plant diseases, etc. Practically all of these can be overcome to some extent.

One of the greatest factors in getting maturity of grains, is for the plants to have a sufficient supply of plant food elements in a proper proportion. On most soils which have a high productive capacity, the most important plant food element for consideration is phosphorus, for getting a proper proportion between the plant food elements. There are two reasons for this: one is, that the phosphorus supply in practically all soils is deficient for best results; and the other is the difficulty which plants have in securing this element, as compared to nitrogen. As a rule, it is safe to consider that the growth of stalk and straw is evidence of the amount of nitrogen secured by the plants; and the amount of grain formed an evidence of the amount of phosphorus the plants secured, though, of course, some nitrogen is needed for the grain and some phophorus is needed for stalk and straw. On much of the better land plants can secure nitrogen enough for 100 to 200 bushels of corn per acre, as shown by the growth of stalks, but the phosphorus capacity is often only from 40 to 50 bushels, or 50 to 60 bushels.

Just what would be an ideal ratio between these most important elements, may not be easily determined, but the indications are that under such a condition, the crops would consist of equal weights of grain and straw or stalk. That is, a ton of grain with a ton of straw or stalks. Under such a balance of food elements there would be the greatest probability for a complete maturity of the grain.

STUDY OF PLANT GROWTH.

To have a better understanding of the problem we should study the plants themselves and their actions. Take a corn plant for example: We plant a kernel of corn in the ground and it grows when conditions are favorable. Through absorption of heat and moisture the dormant life becomes active, and the insoluble food materials are rendered soluble by the actions of various enzymes, and the new plant is nourished for a time by the food stored in the kernel for this purpose. These enzyme activities and the vigor of the

young plant is very much dependent on the matuirty of the seed which was planted. The roots soon spread in the soil and the leaves in the air, and the plant begins to take food from both soil and air, though it may continue to take nourishment from the seed for some time or until it is exhausted. Its development continues, with enlarging roots and tops until the time comes for it to close its vegetative growth. There are two periods in the growth of the grain plant; the vegetative and the reproductive. In the first are formed the leaf, stem and root; and in the second there is formed the grain. About the close of the vegetative period the sex cells are formed and mating takes place, whether the pollination be open or closed. With the mating of the sex cells there is formed the beginning of the progeny or new generation, and the plant is ready to enter the reproductive period, or the development of the seed and grain. During the vegetative period the food elements which come from the soil, which are to be used in forming the grain, are assembled and held in reserve until needed, to a large extent. Of the elements held in reserve phosphorus is the most important for consideration, because it is likely to be the most deficient. If plants can secure only as much phosphorus as is needed for making its root, stem and leaf, so that none be held in reserve for grain, there will be little if any grain produced. When nitrogen is in excess of a proper ratio to phosphorus, there will be a rank growth of stalk or straw, and a greater use of phosphorus in making the vegetative growth, tending to leave less in reserve for use in forming grain.

During the reproductive period the main work of the plant is to fix carbon from the air, and convert it into sugars and starches and move them to the grain, while it is moving other elements also to the grain. The composition of the grains shows about one per cent of the dry matter to be mineral elements, including phosphorus; about two per cent of nitrogen, and about 97 per cent various forms of carbon compounds. This small per cent of soil elements enters largely into the development of the progeny, the true seed or embryo, and as the plant seems to be more interested in the development of its true progeny than in storing the food supply, it largely ceases the storage of food materials in the grain whenever the movement of phosphorus ceases from the plant to the grain, and the grain may remain unfinished.

When nitrogen and phosphorus are held in reserve in proper balance in the plant, there is a normal development and a possibility of perfect maturity being reached. There must be a continuous movement of phosphorus from the plant to the grain during its period of development if complete maturity is to be reached. If the movement of phosphorus ceases at any time, the development of the grain is arrested, and immaturity is the result. Such immature grain may dry out and make a low commercial grade, or it may be attacked by disease and have little value. The rate of development of the grain, or the rapidity with which the food materials are stored in the grain, is largely dependent on the rate of flow of phosphorus from the plant to the grain, and this is measured to a large extent by the amount held in reserve.

PROPER BALANCE OF NITROGEN AND PHOSPHORUS.

The plant needs about a certain ratio of nitrogen and phosphorus for forming grain, and when nitrogen is in excess of phosphorus, some of the nitrogen will remain in the plant as excess to attrack diseases and cause other weaknesses.

One of the greatest economic losses has been due to a lack of phosphorus to balance the nitrogen in the better soils of the state. With available nitrogen enough each year for from 100 to 200 bushels of corn per acre, but with phosphorus enough for only 50 to 60 bushels, the yields have been determined by the phosphorus capacity, with losses of the extra nitrogen. Not only a loss of nitrogen, but such excess has proven harmful in many ways, among them a low quality of grains due to their immaturity.

For a proper grain production the grain plant has much work to do, in assembling the food elements from the soil and air, in forming the many different chemical compounds, in moving them where needed, and in the final development of the seed with its stored food materials. All of this

work must be done by comparatively few plant cells, and these are the active or living cells. The ability of these cells to perform their various active functions is due to the nuclei which only such cells contain. The rate at which the various functions of the plant are performed is dependent on these nuclei, and scientists have determined that the activity of the nuclei is greatly affected by the phosphorus supply. Hence, with a more abundant phosprohus supply the plants are able to do their various kinds of work in a shorter time. When there is a high nitrogen supply in the soil, an increase in the phosphorus supply causes the plants to grow more rapidly and close their vegetative growth in from one to two weeks earlier, as well as to shorten the reproductive period so that maturity may be reached from two to three weeks earlier. By shortening the time for both vegetative and reproductive functions, the action of phosphorus is valuable in tending to overcome several factors which tend to cause immaturity.

PHOSPHORUS INFLUENCING FACTOR ON QUALITY.

The action of phosphate treatments in hastening the growth and maturity of grain crops, has been constant and consistent in proportion to its use, with all grain crops, when nitrogen deficiency was not a factor to be considered. Only a few cases need be cited. The year 1917 was one of the most extreme ever known in the corn belt for immaturity of the corn crop. In that year a strip of practically virgin land, to which phosphate had not been applied, joined a field to which five tons of raw phosphate had been applied per acre, during the previous 16 years. The crop was corn. On the virgin land the corn did not close its vegetative growth and tassel until August 1st to 10th, and at husking time the corn was so immature it contained about half its weight as water. On the phosphated land there was practically no larger growth of stalks, but they tasseled about July 15th, and at husking time it gave a fair amount of quite well matured seed ears, and was all safe to crib, though complete maturity was not reached because of the early frost.

There have been several years when oats on well phosphated land have matured sufficiently to weigh from 30 to 35 pounds per bushel, when oats on unphosphated land weighed but 25 to 27 pounds per bushel. It is usual for wheat on phosphated land to shoot and head several days earlier than on unphosphated land, and for maturity to be reached a week or ten days earlier. The harvest of wheat on unphosphated land is frequently postponed for a week or so after the harvest on the phosphated land, waiting for the wheat to ripen. The unphosphated land does not have as much ability to grow and mature a twenty bushel wheat crop as the well phosphated land to grow and mature a fifty bushel wheat crop.

In considering the problem of getting plants to secure nitrogen and phosphorus in a proper balance for grain production, some attention must be given to their root forming habits. The nitrates in the soil become dissolved in the soil moisture and may diffuse throughout the soil and enter the roots by osmosis. Hence, for the plant to secure nitrogen it is only necessary for the soil moisture to flow into the roots, without effort on the part of the plant, except to form the roots. Because of the tendency for dissolved phosphorus to revert to insoluble forms it does not get into the plant in such an easy way. For the most part, the phosphorus enters the roots which are in contact with the phosphorus bearing material, and may require some effort on the part of the plant. There is a tendency for grain plants to make a larger root system when there is a long nitrate supply, and a smaller root system when there is a high nitrate supply, though there are a number of factors which enter in the development of root systems. As there is a tendency to form roots in inverse proportion to the nitrate supply, and a tendency for phosphorus to be secured in direct proportion to the root formation, the problem of getting a proper balance into the plants is further complicated.

FUNCTION OF PLANT ROOTS.

There are at least four functions to the roots of plants which form grain. One is to gather food from the soil. This is usually done in about

the proportion to the amount of root system. Another, is to supply moisture during the grain forming period. This is done largely in proportion to the depth and extensiveness of the root system. Another function is to brace the tops so as to hold them in an erect position so that the leaves can function better in taking carbon from the air. The brace roots are usually formed somewhat in proportion as the feeding roots have been formed. Another function is to hold in reserve a large part of the phosphorus which is to be used later in forming grain. This function is best met when the root systems are deep and extensive. Deep and extensive root systems are best secured by maintaining a high degree of fertility in the deeper soil which lies below the line of plowing. The same factors make a sub-soil fertile as will make a surface soil fertile, namely, limestone, phosphorus, nitrogen and active organic matter. This can be accomplished by growing deep rotting clovers, and plowing under a good growth after they have reached a dormant period in the fall, after the plant food materials which have been taken from the soil have been stored in the roots in preparation for winter. Analysis of soils under such a condition indicate a large increase of nitrogen, phosphorus and active organic matter in the deeper soil, which has a high value in getting deep and extensive root systems, enabling the plants to reach better maturity as well as a higher production of grain.

That is all I have to say unless there are some questions. I thank you. [Applause.]

PRESIDENT ALLEN: The next speaker on the program is Mr. Webb, who will talk on the subject of "Variety Improvement."

VARIETY IMPROVEMENT.

WM. WEBB, *Will County, Illinois.*

MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: So far we have had an inspiring and instructive program today. It seems to me that this would be a good time to stop after listening to Dean Mumford's excellent address as well as that of Mr. Mann.

Wm. Webb.

I have been asked, however, to point out and sum up what can be gained in dollars and cents by "Variety Improvement", soil treatment and crop rotation. It can be obtained by using varieties that are disease-resisting and by planting them on soil that is well-balanced by soil treatment and by using the right kind of crop rotation. My text is so long and broad that it will be hard for you to tell whether or not I am keeping close to my subject.

I think there are better times coming for the farmer. The best business men are beginning to realize that the farmer holds the key to world prosperity; that when the farmer is down, all other business will have to suffer sooner or later. I realize that we have been living in a fast age and are now going through a period of readjustment, and that we will soon be back home or to our own. To illustrate: there was once a minister preaching to a large audience. He was human like the rest of us. On some days he was optimistical, looking on the bright side of life; on other days he was pessimistical, seeing only the gloomy side of life. This day he was looking on the dark side of life. He was telling the audience that the American people were living in a fast age and that we were all amusement crazy. I too think there is some truth in such a statement. He said that the automobiles are taking the people away from the churches instead of drawing them to worship. "Why", he said, "the Ford automobiles are taking people to hell

by the thousands every day." One good lady in the audience spoke up and said, "Amen". The minister turned to her and said, "My good sister, why do you say 'Amen' when I tell you that the Ford automobiles are taking the people to hell by the thousands and thousands every day?" "Why, my dear pastor, it makes me feel good to hear you say that, because I know that wherever a Ford automobile can go, it is able to turn around and come back." So, I think that we as farmers are coming back again. [Laughter.]

SUCCESS WITH ALFALFA.

We have in Illinois a great many different farm interests to look after and carry on successfully. We have quite a large district where dairying is the chief interest. Other localities have stock raising as their chief interest while still others have stock feeding. Then, we have our grain farmers, fruit farmers and others. The dairyman, the stock raiser and the stock feeder must raise or buy their feed, and it seems to me that it would be cheaper and better to produce as much of it as possible on the farm. In order to produce his feed on the farm, he should know that alfalfa would be the best and cheapest feed for hay since it can be fed profitably to all stock on the farm. He should know that alfalfa is slow in starting and needs a good seed bed of sweet soil, and that the seed should be inoculated to enable it to draw nitrogen from the air. Alfalfa, without inoculation, will not last long or make a large yield. Alfalfa, after it is well started, is the fastest growing plant we have. It makes three good crops in one season; that is, a crop every six weeks. If the farmer uses the right kind of improved seed on good soil, it will smother out Canadian Thistle in two seasons. Alfalfa on soil that is well balanced with phosphorus, will make a large yield year after year, but it will not last long on soil that is low in phosphorus.

We find that on our Will County Experiment Field, on the plots which have no treatment, the alfalfa will die out in a few years; but the plots which are treated with lime and rock phosphate will remain in good condition for many years and produce from thirty to forty hundred pounds per acre more each year. We have a small field on our farm that has been in alfalfa for ten years and has produced over five tons per acre each year. This field is still in good condition. We applied 2,000 pounds of limestone per acre to this field ten years ago, 2,000 pounds of rock phosphate per acre five years ago. I undertook to dig up some of these ten year old plants and after digging and digging I gave it up, thinking life too short for that job. The roots had evidently gone down through and were on their way back again.

VARIETY CHARACTERS OF CLOVERS.

To determine the value of the different clover roots and the depth they would penetrate into the sub-soil, we seeded last spring on the Will County Experiment Field with a nurse crop of oats, alfalfa, biennial sweet clover, annual sweet clover, mammoth clover, medium red clover and alsike clover. In the fall after they had been growing five or six months we dug up a square of each variety and found that the alfalfa and the biennial sweet clover had gone down into the soil from 2 to 3½ feet. The sweet clover had the largest roots, the mammoth clover roots were next in length, having gone down into the soil 18 inches or more, the medium red clover was next, having gone down 12 or 15 inches; but the annual sweet clover and the alsike had not gone down very far, and the roots were small and withered.

We should know that biennial sweet clover makes one of our best pastures and must have sweet soil. We should know that after the soil has been made sweet with ground limestone it will not need any more lime until it becomes sour again, and we should also know that it will not become sour very soon if we use the right kind of crop rotation, which will also help to destroy insects, and kill many plant diseases in the soil.

If we use the right varieties of sweet clover and keep it fed down close, it will make the best pasture. Clipping sweet clover sometimes kills it. Biennial sweet clover plowed under makes the best kind of green fertilizer for the corn crop. We find in the fall, on land that is not treated, that we

get 3,310 pounds per acre of sweet clover to plow under for green fertilizer. When we add lime we get 6,142 pounds per acre. When we add lime and rock phosphate we get 8,167 pounds per acre. In the spring we get nearly the same weight of top growth to plow under, plue the weight of roots in the ground.

Biennial sweet clover and alfalfa are deep rooting plants. They go down into the sub-soil aerating it, and draining it so that the corn roots may follow down deep into the sub-soil. They will then get some of their plant food from the sub-soil. Being so deeply rooted the corn plants will not suffer from dry, hot weather. The soil will be well filled with live humus and be in good physical condition so that the corn plants will be able to stand both dry and wet weather.

SMALL GRAINS AND CORN.

In growing small grains like wheat, oats or barley, after we have found the best varieties to grow in our localities, by selection and then by testing, we should know that when the soil is well balanced with nitrogen and phosphorus, we can grow 40 to 50 bushels of wheat per acre, 50 to 75 bushels of barley per acre, 70 to 100 bushels of oats per acre, and the straw will not go down as it will be strong and stiff. But if the soil is high in nitrogen and low in phosphorus the straw will be weak and go down and the grain will be light in weight, of a poor quality, and low in yield.

Now, if we are going to grow corn for feed or the market, we should know many things about the corn plant. It is very hard to keep pure since it is an open pollinating plant, and will cross at a long distance; the silk is the female and the pollen is the male. We should know that a dull colored ear, composed of soft starch, is very susceptible to disease and is a low yielding ear of corn. An ear that is too smooth with small, shallow, flinty kernels and no indentations, is beginning to degenerate and will not give a high yield; while an ear of corn with a medium smooth indentation, bright luster, medium depth of kernel, horny composition, free from soft starch, medium space between rows, kernels full and plump at germ ends, and with a bright, clean, white shank should be free from disease and a high yielder of sound corn. By planting ears of this kind on individual rows to find the highest yielding ears and then planting a number of these high yielding ears together in the center of the field, we will be able to increase our yield from 5 to 10 bushels per acre or even more. By taking these best ears and testing them on the germinator and using only the ones that show to be free from disease in this test, and of strong vigor, we can again increase our yield of sound corn.

LOOK TO THE CORN KERNEL.

Again, we should know that the ear of corn is not the unit, but that the kernel on the ear is the unit. All of the kernels on the ear are from the same mother, but they may all be by different fathers. Thus, each kernel may have different breeding characteristics; some kernels may yield many more bushels per acre than others.

We find that by taking a good, sound utility type of corn, shelling off the kernels, and dropping them into a solution of salt and water or of nitrate of soda, which should have a density of about 125, that the high gravity kernels, the kernels that sink, will be sound and horny, and the ones that will float, the low gravity kernels, will be made up of a less horny composition. When we plant these two lots of kernels on rows, side by side, on good rich soil, free from corn root rot, we get from the high gravity kernels from 90 to 91 bushels per acre and from the low gravity kernels from 87 to 88 bushels per acre, a difference of 3 or 4 bushels per acre. When we take a sample of rough dull colored corn, which is made up of soft, starchy kernels and divide them, planting the high and low gravity kernels in rows, side by side, we get 68 bushels per acre from the high gravity and 58 bushels per acre from the low gravity kernels. This is a difference of 10 bushels per acre between the low and the high gravity kernels; a difference of 23 bushels per acre in yield between the two types of corn.

Then we find that it is possible, by making many careful selections of strong vigorous plants from the field, to find plants that are more or less disease resistant, drought resistant, and less susceptible to wet and cold. Some types, some strains and some varieties of corn are much more disease resistant than others. Thus, some varieties will yield higher than others on diseased soil.

In my experience of selecting seed corn from the field, which covers many years of work, an ear of corn on an ideal corn plant should be about mid-way on the stalk, with about as much length of stalk above the ear as below it. The ear should have a strong, medium length shank, hanging at about a 45 degree angle on the stalk, so that it will shed the water. The ear should be nicely covered with husks so as to protect it from external infection. The stalk should be large and strong with many broad green leaves. When the corn is approaching the dent stage the husks should begin to turn brown, and the stalk and leaves should be still green. The plants should have a large deep root system so that they can stand up as straight and as erect as an American soldier. An ideal corn plant should inspire the American farmer in such a way that he will think of the old familiar lines that I love to hear repeated:

"That the rose may bloom for England,
The lily for France unfold,
Ireland may honor the shamrock,
Scotland, her thistle bold;
But the shield of the Great Republic,
The glory of the west,
Shall bear a stalk of tasseled corn,
Of all our wealth the best."

Sir Daniel Hall of England told us while he was at Urbana that they had improved their varieties of wheat and built up their soils in such a way that for the last 80 or 100 years they have produced an average yield of 32 bushels per acre.

I think Illinois in the past 10 or 20 years has made more real progress in all kinds of agriculture than has been made in the preceding 100 years. Twenty years ago no one thought it possible for one cow to produce 1,000 pounds of butter fat in one year. Ten years ago there was but one cow that produced this amount of butter fat, and she produced 1,058 pounds in one year. Today there are 90 or more cows that have produced over 1,000 pounds of butter fat, each in one year, and more than 30 cows that have produced over 30,000 pounds of milk each in one year.

At our State Corn Show, held in Urbana this winter, we did not have any outstanding samples of corn. They were nearly all good, and many of them were so near alike that it was hard to tell which were the best. This goes to show we are all progressing by the use of better varieties, care in selection, and more careful breeding. Testing our corn on the germinator will enable us to throw out the diseased corn, keeping nothing for seed but the disease-free corn. In this day and age I think nearly every farmer tests his seed corn before planting to determine whether it will germinate. Why not, in place of testing it in soil where you can not see the root growth, test it in an incubator or some thing of that sort, where you can watch the roots develop? This will enable you, not only to discard the seed that will not germinate, but also the seed that is affected by root-rot, such as diplodia infection, fusarium infection and scutellium rot, which, when planted, will greatly reduce the yield.

VARIATION IN CORN YIELDS.

Within the varieties of even close pollinated species, there are many variations. Different stocks of the same variety contain many different families; hence, the possibility of wide variation in the yielding ability of different stocks.

Here is a table which you can peruse for your own information:

VARIATION IN YIELD AMONG COMMERCIAL STOCKS OF THE SAME VARIETY WITH RATHER POOR, THIN SOIL.

	Oats.	Season.	No. of stalks tested.	No. of replicate plots.	Yield (bushels per acre). Lowest.	Highest.	Range.	Probable errors.
(1)	Red rustproof	1919	12	4	59.0	71.9	12.9	1.39
(2)	Red rustproof	1920	8	10	25.9	36.0	10.1	1.54
(3)	Red rustproof	1921	30	4	13.9	29.4	15.5	1.42
(4)	Kherson (60 days)..	1920	12	10	28.9	51.7	22.8	1.54
(5)	Kherson (60 days)..	1921	31	4	25.3	43.7	18.4	1.42
(6)	Kherson (60 days)..	1922	59	12	19.8	29.7	9.9	1.01
(7)	Kherson (60 days)..	1923	58	8	34.4	55.5	21.1	1.46
	Wheat.							
(8)	Fulcaster	1922	47	9	17.8	32.0	14.2	1.28
(9)	Fulcaster	1923	50	9	9.0	26.4	17.4	0.96
(10)	Poole	1922	15	9	20.1	29.7	9.6	1.07
(11)	Poole	1923	15	9	14.6	23.1	8.5	0.59
(12)	Red May	1922	14	9	21.8	31.1	9.3	1.07
(13)	Red May	1923	15	9	13.0	22.6	9.6	0.73

Since it has been abundantly proven that there are marked differences in the yield and characteristics of different varieties and also that commercial stocks of the same variety differ, it becomes essential for the best success that those commercial stocks of the pure line selections having especial merit be preserved by some system of standardization or certification.

CERTIFICATION OF GRAINS.

The Illinois Crop Improvement Association has been certifying small grains for a number of years. This last year they took up the certification of corn, certifying several different varieties in eleven different counties. They hope to carry on the work in a larger and broader way this year. We think that this is the best way for the farmer to get pure seeds.

Q. What is the practicability of classification of corn for gravity? Is that just for your special seed ears or do you recommend that as a practice for seed corn?

A. Well, in the first place, it requires a deep study. Everybody can't do it. It is like everything else; some individuals are a great deal better breeders than others. However, in that way, we find that some kernels are a great deal higher yielders than others.

Q. As I understand it then, "gravity" is another way of getting at maturity?

A. That is it. Maturity, yield, and disease resistance.

Q. And you can get at maturity in another way too, can't you?

A. Oh yes. Now, with us in Will County, rock phosphate shows up wonderfully, and we use rock phosphate on our farm the same as they do on the Will County Experimental Field, and the same as Mr. Mann was telling us. I know, for instance, that when frost has affected corn in our locality, on farms where these substances were not used, our's got by fine. The fields treated with rock phosphate matured much faster and were ripe ten days before the others. Another thing, on treated land the quality is so much better.

Q. This is the most profitable crop then that you have been talking about?

A. Well, that is a hard question to answer. I would not advise raising any one crop too much. Some of we farmers are better off in the northern part of the state than you in the southern part, because we carry on a better rotation, and we haven't as much corn root rot in the northern part as you have in the southern and central part where you carry on a corn and oat rotation.

Now I have a few figures that we will look at. I thank you. [Applause.]

RESULTS OF EAR-ROW TEST ON DISEASE-FREE SOIL.

Disease-free seed.		Diseased seed.	
Row No.	Bu. per acre.	Row No.	Bu. per acre.
6	66.10	3	80.06
2	87.09	5	59.19
4	86.40	7	64.41
8	81.00	9	70.30
10	75.51	11	64.62
12	82.10	13	63.37
14	86.62	15	69.17
16	86.32	17	65.00
18	70.00	19	55.15
20	72.00	21	55.15
22	64.30	23	57.23
24	75.33	25	71.57
Average yield	78.56	Average yield	64.60

RESULTS OF EAR-ROW TEST ON DISEASE-FREE SOIL.

Disease-free seed.		Diseased seed.	
Row No.	Bu. per acre.	Row No.	Bu. per acre.
6	61.94	7	44.72
8	65.01	9	52.11
10	67.62	11	60.61
12	67.20	13	57.98
14	70.29	15	72.04
16	71.16	17	67.20
18	72.93	19	60.27
20	72.76	21	70.67
22	74.83	23	64.43
24	76.13	25	58.17
26	74.83	27	70.67
28	76.13	29	60.21
30	83.14	31	56.77
32	74.80	33	49.89
34	81.06	35	60.29
36	58.05	37	56.77
Average yield	71.74	Average yield	60.18

PRESIDENT ALLEN: We will stand adjourned now until seven o'clock this evening.

WEDNESDAY EVENING SESSION.

February 18, 1925, 7:00 o'Clock P. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: For our opening number on the program we have with us Ford and Glenn, of WLS, the Sears-Roebuck Broadcasting Station, Chicago, who will entertain us with songs. However, before introducing them, I want to present to you Mr. Edgar Bill, manager of WLS, who will speak to you for a few minutes.

MR. EDGAR BILL: MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: It is a pleasure to come down here and have our boys sing a few numbers for you folks, because our station is primarily devoted to agriculture. The boys are going to sing for about twenty minutes, and then I am going to relieve them for four or five minutes in the middle of their songs and tell you in a few words about our agricultural activities.

Now I will introduce to you Ford Rush and Glenn Rowell of our station. Before they finish I want them to sing some of their lullaby songs for the kiddies.

Songs.....Ford and Glenn

MR. EDGAR BILL: May I ask how many of you folks are radio fans? Will you hold up your hands? That is fine.

Well, I want to tell you, it is a real pleasure to meet radio fans face to face. I don't know whether you realize it or not, but all of the programs

of the radio stations go on in a little room 16 x 24 feet and there is nobody in there except the performers, and sometimes it does get pretty lonesome, and sometimes the artists wonder whether or not the folks at the other end are enjoying it.

May I ask how many of you folks are farm people? All of you, I see. I want to tell that WLS is primarily devoted to agriculture and that we have and are going to have farm people on our programs. If you folks have any particular subject that you would like to have on radio programs we will be delighted to hear from you. Send us your suggestions. We look over every letter that we get and tabulate them and we then know how many mention Ford and Glenn and how many the farm speaker and how many the other features that we put on during the week.

As you know, we have farm programs every noon between twelve and one, and farm programs three evenings a week, between eight and nine o'clock. And, we are interested in home makers too. We have a Home Maker's Department, and we would be delighted to have your suggestions and your frank criticisms, because after all, the radio station is valuable to those who run it to the extent that it pleases its listeners.

Now, I want to tell you one other thing: We are having a National Corn Show, and we invite all of you people to send in your corn to our corn show. We are offering $1,000 for the best ear of corn, and we are offering

Ford Rush and Glen Rowell—W. L. S.—Sears-Roebuck Broadcasting Station.

$1,000 to the county organization, the County Farmers' Institute, the County Farm Bureau, or any other farmers' organization which sends in the most number of ears. Then we are offering a county prize of $5.00 for the county sending in fifty ears or more. We invite you all to send in your corn.

The boys are now going to sing "Down On The Farm."

Songs.....Ford and Glenn

PRESIDENT ALLEN: As you all know, it is the custom of our Farmers' Institute to have the President deliver an address. President's addresses are very variable things. Sometimes they address on one subject and sometime on another. Perhaps you will think that the theme I have chosen is not particularly fitted for this meeting, but I think it is one which affects every farmer in this state as well as every consumer of food.

Ralph Allen.

The outstanding agricultural problem of today seems to be that of marketing grain, at least it is the great problem now confronting the Illinois farmer. For the past six years the farmer, or his friends, have been struggling with the solution and many plans have been suggested and several very elaborate schemes have been tried out but thus far nothing practical has been accomplished. However, I think we have made some progress.

I have read that President Coolidge, whether from his own experience matters not, has said in substance, that the grain marketing scheme which succeeds will begin in a small way and grow to larger proportions. Very likely the plan which eventually succeeds will start so small and inconspicuously that for a time it will not even attract public attention, and this will very likely be for its own benefit and protection.

In the natural order of things it would seem most likely that the solution of grain marketing will be by those who have had many years of experience as their guide. And it is also very likely that very much the same experiences will happen to them in the larger grain markets as has happened to them in the smaller local markets. They will find the same principles in control and bringing about the same results. And, if this is so, the problem of gaining a farmers's influence in the larger markets will prove to be not so very complicated after all.

Several principles have been learned by farmers in their local grain trade. One of these is that the party which will pay the highest price for grain, fixes the price of grain in that market. Another is, that as long as the Farmers' Companies make the price as it should be, that is, as high as the market demand will permit, there will be no lack of grain brought to the farmers' companies, so that agreements, or contracts, binding farmers to sell their grain to their own companies are wholly unnecessary, and are only a source of controversy. Again, no matter what combinations may be made to prevent them, the buyers of grain will come freely to the source where they can find it, proving the old adage that the buyer seeks the supply. These principles seem very simple yet when properly considered are far reaching in their influence.

There has been a theory of late that if in marketing our grain we can dispose of the surplus that there will be little difficulty in taking care of the price of the balance; that it is the small surplus which defeats the bulls against the bears, and many plans are being devised for doing away with this troublesome surplus. There is something very elusive about surpluses, that is, in our calculation about them, or rather miscalculations. Suppose we have a surplus of wheat and a consequent drop in price and in our disappointment we shut off the supply to those who want it, there would arise a great cry for wheat and a rapid increase in price. But how about the troublesome surplus? Would that be diminished? Surely not. It would be increased by the amount the consumers went without eating. Suppose on the other hand with this surplus on our hands we encourage

the consumption of wheat by a lower price to the consumer so he will consume more or it will reach those who seldom use it or it will be used more lavishly or for new purposes, which is always the result of lower cost, it is soon found that the surplus is disposed of and may be quickly followed by a deficiency. This has happened repeatedly in market experience and is this not realy the only sensible way of disposing of surpluses?

If I were to have my way about it, I would abandon for good all schemes which artificially interfere with the free operation of the laws of supply and demand, whether these schemes are concocted by either the farmer or the grain gambler. This law is well worth studying. That the law of supply and demand regulates prices is generally admitted. A surplus of any commodity on the market or even its existence depresses, while a shortage tends to enhance prices. But there seems to be limitations to the influence which the supply has in either direction in price changes. To illustrate: if we have a double crop of strawberries, will the price per quart be one-half the normal price? It may, but not for long, for those who never before could afford strawberries will commence eating them and because of their profusion the old consumers will buy more lavishly so that the excessive supply will easily be taken care of. The human race does not make its own choice of food. We live on such foods as we can get most economically, consequently the demand is greatest for the most abundant foods, or saying it in terms of the law, a supply creates a demand.

Equally true there is the opposite clause in the law that a demand creates a supply. If we violate this clause by artificially creating a demand by government interference or otherwise making more profitable prices than the surplus would permit, the producer will as naturally endeavor to supply that demand as though it was a natural one, so that the overproduction will become greater than before and all the more confound the artificial interference.

Can anything be done by farmers, or by government, to solve this marketing problem besides interference with the free action of the law of supply and demand? I think a great deal can be done. First of all, we farmers can refrain from any interference or from asking the government to pass laws that will interfere with supply and demand, and we can also do our best and ask the government to do its best to restrain others from interfering. If we farmers do our part in this matter the question then is how can others be made to do their part? A great deal can be done by government regulation of the Board of Trade, remembering that that which is good in the Board of Trade should be preserved while that which is not good should be destroyed.

But, laws alone will not suffice. The temptation as well as the opportunity to violate the rules should be removed. This can be done by the farmers getting into the terminal markets themselves, getting in the same as any other party would get in. Not by trying to buy out all the grain companies now in the market, nor by attempting to corner all the grain by means of long term contracts with farmers, but by incorporating the same as any other corporation and commence buying and selling grain in the regular channels of trade. If we persue the policy of paying the highest prices for grain that the demand will sustain, we will then be the one who will determine from day to day the market price paid to farmers. And, as we have found in our local trade, we will also find that by pursuing this policy, that the bulk of grain will be drawn to our house and then with paying the high price and receiving the volume of grain we will, as in our local business, find that we will have gained sufficient influence to correct the evils of the trade. Locally we stopped the making of secret understandings between supposed competitive houses of what would be paid the farmer for his grain. We did it by keeping out of those secret conferences and by always paying

for grain all the market would stand. The same policy would effectually stop what is called price manipulation in the large markets, for with the farmers in the relative position as we are locally, there would be no chance to carry out such price agreements.

Again, the advent of the farmer into the terminal market will be the greatest deterrent to speculation or gambling in grain, the buying and selling of grain in which there is no grain, for the opportunity of the grain gambler is lost when he loses the chance to influence the rise and fall of the grain market. The farmer in the large markets will have even greater opportunities than these, for the opportunity should come by which he will be able to see to it that every fluctuation of price paid the farmer will be reflected in the prices paid by the consumers of his products, and in this way he will have the opportunity of taking up the bearish effect of market surpluses. The time seems ripe for the farmer to now enter the larger markets and the plan should be entrusted to those who have had long experience in the grain trade.

I wish before closing to speak of one of the rather popular ways for government to help the farmer. I refer to the different plans for the formation of a government grain exporting company which is presumed to dispose of the surplus grain at a loss in order, by the help of a protective tariff, to secure a high price for grain domestically consumed. This is a proposition which is well worth the very sober consideration of the farmer whose grain is to be so sacrificed. Speaking as a farmer who raises grain and who is directly affected by such legislation, I cannot look favorably on such a plan of disposing of surplus grain. I do not want a part of my grain sacrificed for the benefit of the other part, for it is what all our grain sells for that determines the profit or loss.

I can see no benefit in losing money to our foreign customer in order to get more from our home customer. We might just as well let our home folks in on the loss as the foreigner, letting them have the grain at what we finally get. I am not in love with the plan of the government doing my private business. Such a plan involves too many vicious features. It involves the idea of turning the sale of my grain, or a part of it, over to some one over whom I have no control, and regarding whom I have no selection, and worse yet, from whom I can have no redress in case of unsatisfactory service. No matter how dissatisfied I may be with the service rendered, I am still compelled to use the service. Furthermore, I do not care to turn the sale of my grain over to someone, the appointment of whom rests with the head of a political party and who is responsible not to me, but to the head of the party. Looking at it from a cold business point of view, the plan for a government exporting company seems preposterous. However, if the government cares to go into the grain exporting business on its own responsibility, that is, if we farmers are not called upon to bear the expense or losses, and will enter the market and buy our grain and pay for it spot cash on delivery the same as other buyers do, I would make no serious objections, though I think the government would show no great wisdom in doing so.

I want to say, however, that I have great faith in the good sense of my fellow countrymen. At the time that the grain exporting bills were before Congress I had faith they would not pass. I am trusting still in this good sense, that while many bills for the relief of agriculture will come before Congress, that only those of sterling worth will become law.

I thank you. [Applause.]

I now take great pleasure in introducing to you Mrs. Lena S. Mann, President of the Household Science Department.

MRS. LENA S. MANN: Ladies and Gentlemen: I am not going to take up your time in making any long introduction for the next speaker. I am sure you are going to be interested in her subject. Miss Sweeney comes to us from the Merrill-Palmer School, Detroit, Michigan, a rather unique institution. She is a nutrition specialist for that school, and she is going to talk to us about "Your Real Business", and I hope you men are going to be included in this subject as well. Sometimes we feel that men are not as much interested in home making as we are, yet we find in the bottom of their hearts they really are.

Mrs. Lena S. Mann.

In this connection I am reminded of the stroy of the young man and the young woman who went to church and wished to be married before the minister was to preach his evening sermon. They sought out the minister and told him of their intentions, but he said that he did not have time to marry them then, but that if they would go to the back of the church, in a little side room, and wait there, he would perform the ceremony after the services. Well, after the minister had preached his sermon he told his congregation that he had a nice little surprise for them; that if they would remain seated he would give them a surprise. So, they all waited. The minister then raised his voice and said, "Will the young man and the young woman who would like to get married please come forward?" Much to the minister's surprise one young man came out followed by eleven young ladies. [Laughter.]

Now, you men are going to be as interested as the eleven ladies here tonight. The subject is "Your Real Business" and it is going to be given us by Miss Mary E. Sweeney.

YOUR REAL BUSINESS.

Miss Mary E. Sweeney, *Merrill-Palmer School.*

What is "Your Real Business?" What is there in all the world that you give your tears, your sweat, your sacrifice and your life for? Is it for the earning of money? Is that the reason you are the farmers of Illinois? Is it that you may earn money, or is it that you may have the most normal home that America provides, that kind of home that is maintained and can be maintained on a farm where everybody shares an opportunity? I am glad that you have given me the privilege of talking tonight to people who still love the soil and the sunshine, who still believe in the blessedness of the out-of-doors; whose fine courage has kept the balance and the poise of America during these storm tossed years since the world's war ended. I am glad that I can talk to you in terms of your own faithfulness and your own patriotism, because every one of us knows that had you been less self-effacing and thoughtful of all the world, we could not at present be quietly and calmly considering the world's questions as we are. And, I am also glad that you are giving me the privilege of talking in terms of the most fundamental things of America, the American home and the American child.

Miss Mary E. Sweeney.

There used to be a time when we thought a

hospital was a dangerous place to go. We thought it was a place where no well kept home wound send its son. Now we realize that a well organized hospital is a safe place for the care of those of our household who are sick. There was a time when all of the business of the world was done in the home, but we realize now that offices are more efficient for the transaction of some businesses than homes. I have a feeling that when the first man went out from the home to the first office that the home maker in that home felt she had lost a large share of her influence in his life. We also find that factories are better places to manufacture things than homes, although once we carried on all of our manufacturing in the home.

You also know, the home is changing. Mothers are changing. Mothers are not exactly just what they used to be. They have changed; their political and social condition has changed, and the fact that they are interested in their community has given them a broader interest and a wider vision. They find that they can't just stay at home. They go out with the family into the community. More than that: a large number of women are industrial and such economic independence has given a broader interpretation to life. There was a time when we said that woman's place is in the home. We still say woman's place is in the home and in the community. Women have changed and mothers have changed; they have come to think in terms of their household and their community. There has come a new social order. All of us go out of our home for certain amusement, for certain types of enjoyment and for certain activities that we used to have in our homes. The theatre, the modern theatre, the movies and all the sports have taken men, women and children out of their homes. And, if you have seen this charming movie "Peter Pan" you know is a lot more interesting than a game of checkers. You know also that the sports are better training in team play than croquet is. You realize that every man and woman must follow, in their real business, their children out into the community. Our homes have been in a state of mid-Victorian mindedness, but we are moving rapidly into the modern state. Have you heard that story of George and Martha Washington? They say that George and Martha Washington came back from heaven by way of San Francisco,—you might know I heard this story in California, they would not have them come any other way. They came home by way of San Francisco, and they crossed this midwest country with its marvelous agriculture on their way to Virginia, and when they reached the slope at Mt. Vernon, George turned to Martha and said, "Martha, I never can do farming in the same old way again. All of my implements have to be changed. Take the tool house; every tool in it has got to be thrown away." Martha said, "Well, now, George, I am not troubled at all about that. There is not a thing changed in the kitchen since we left, and all I have to do is to put on my little apron in about twenty minutes I will have supper ready for you."

I think we don't generally realize that we are dealing, in our real business, with a modern minded child, and I am glad I can talk to you fathers and mothers about this modern minded child, because they are your real business; and, what you have made of them is a determination of your success. I am glad that I can talk to fathers, because fathers have almost forgotten that they are parents these days. So much of the strain, the economic strain and all the other things have taken the father away that he almost forgets.

Do you know that now-a-days you have an electrically started, automotivated, radio-connected child in your home? Do you realize that it is going to take two parents to adequately even put that child to bed? A mother used to be able to do it, but now with the electric-starter model it is not possible at all. It takes all of the moral force of the father as well as the courage of the mother to put him to bed. Do you know that it is going to take both of you to teach him the right kind of food habits? Do you know that it is going to take both of you to teach him the right kind of mental habits and the right kind of moral habits? Do you realize that it takes in this day and generation fathers and mothers to give children the right attitude toward life? Do you realize that there is a great, big, wide gap made by invention and machinery and all the things that have

come into life between the yesterday when some of you were born and the today when your children are born? Didn't you come, some of you, into a kerosene lighted world? Didn't you come into a world where you got your first sensation of motion in one of those delightful old buggies, drawn by a family nag? Weren't you put to sleep with one of those charming lullabys? Do you realize how different and how far away that is from the child who was born yesterday, into whose eyes the first light that shone was that of a hundred candle power electric light and the first sound that it heard was that of a telephone, and the first sensation of motion that it had might have been a Ford car? Do you realize that that has made different impressions, different stimule and induced complexes in that child's mind? Do you realize that that is the child you are dealing with?

Now, if I were to come out to your farm and you were to be kind enough to ask me to go over it, I would size you up as a farmer, wouldn't I, by your flocks, your stock and your fences and your barn doors. If your barn doors were off the hinges and the gates were not all that they ought to be and the fences were down and your cattle and your hogs were the kind that were not very sleek looking and if you had been awful careless about the way you put away your farm machinery, you know what I would think about you. What would you say about a man who let his hogs have cholera? You would say, "Isn't he trifling? Doesn't he know how to prevent cholera? Can't you teach him anything? Doesn't he know what the Experiment Station says about cholera?"

Now, I wonder if I have a right and the rest of the world has a right to judge your real business by your homes and your children! They are the things that express your ideals, your hopes and the things that you believe are worth while in life.

Suppose I would ask you, if you have been about your real business in taking care of the health of the children of the open country in Illinois, have you been about your business and has America been about her business when one in every three of the men that came up to enlist, to defend their country, was physically unfit to even be patriotic? This physical unfitness, as concluded from the investigations carried on by the Children's Bureau, the American Research Council and other scientists, was due to two outstanding causes, lack of medical attention and poor nutrition, and those children were probably made unfit for military service before they were six years of age. There are a number of children that come to us who are under five years of age and who are already beginning to crystalize out their habits of thinking? Do you know that children have already, under five years of age, begun to develop their habits of conduct? Do you know that children of two have well defined food habits? Do you realize that they have fears and inhibitions, and that all of these things appear in children before they are five? Do you know that there are children of three who, not through lack of love, not through lack of devotion, but through a lack of knowledge, must bear through a life time disabling influence because those who loved them most did not know what a human body needed to make it strong and healthy?

You must realize that we have in this group of children under five years of age the beginning of all the problems that appear later in life as crime. Do you realize that we have the misconduct problems that later appear as dishonesty? Do you realize that all of these things are in the making of mothers and fathers before the child is five years old? Do you realize that that is your real business What does it matter if you leave a big farm, a wonderful bank account, if you haven't left to the world a son or a daughter who will carry on all that is fine and all that is worth while in your life that you have left to them?

Now, you men believe what the Experiment Station tells you about hogs, don't you? You believe what the Experiment Station tells you and has proven about cattle, don't you? You believe what the scientist has proven about the crop that you raise, don't you? But, do you believe what science has proven about children? Are you willing to accept the science that has to do with the health, the habit formation, the mental development of children with the same assurance that you receive the science about your busi-

ness, your farming business? I appeal to you men! Are you fair? Could you feed your cattle on a ratio and of the kind that children eat three times a day and keep them alive? There is not a man of you that would try it.

I was down in Kentucky, just across the river from Illinois a few years ago, and I went into a home where the children had every disease that I ever heard of except infantile paralysis and spinal meningitis, and I said to the mother "What in the world is the matter with your children?" "Well", she said, "I don't think there is any reason for it at all." So I said, "There is a reason. There is a reason for everything." And she said, "Well, I can't think of a thing." So I asked her a few questions, and I finally said, "What do they carry to school in their lunch boxes?" Well, she finally said, "Come to think about it, they carry sausage, biscuit, pie and such as that from hog killing time to spring chicken time, but I don't see what that lunch has to do with disease," she said. I said, "You don't use the same method, do you, on that fine Jersey cow you have out there?" "Oh", she said, "no, for she may die."

Now, you believe in silage, don't you? In traveling over the state, I see clover crops everywhere. You people believe that your animals have to have a balanced diet. Now let me ask; are you seeing that the children who live in the open country in Illinois get anything like as well a balanced diet as your cattle do?

I was very much interested in a neighbor who lived across the road from me. They had an epidemic of measles and the nurse asked me if I would not talk to them about their diet. Well, I don't like to talk to my neighbors too much about diet as a basis for neighborhood conversation, but I decided I would do it anyhow. So I went to the lady and spoke to her about it. I said, "All of your children have measles, haven't they?" "Yes," she said." I said, "Well, don't you think if you had a bit more green food in your diet that the children would not be so susceptible to disease?" She said, "Honey, don't you go to worrying about us. Everyone of them children is just like their paw." Well, I said, "They don't have to be, do they?" And she said, "Yes, I think it just got to be; tall, lean and lanky, and taint no use anybody worrying about it at all; they were just meant to be that way." Then she turned around to me and she said, "I hear that you was supposed to know a lot about food?" And I said, "Well, I know some things about it." Well, she said, "You don't mind my being frank, do you?" So I said, "No, go ahead." She said, "Well, I just want to say I don't think you are much advertisement for your own "vittals". [Laughter.] I didn't stop to explain to her that I suffered from the difficulty of having a Packard engine on a Ford chassis, and the handicap of the engine on the frame brings about the condition I have.

No I want to ask of you, how much do you think the diet of the people in the open country has to do with the tuberculosis that we have in the open country? I want to ask of you if you think that the children of Illinois deserve to be protected against rickets? Do you know that the scientific men in one of our great Universities who are examining a group of children find that 85 per cent of the children have had or now have rickets? Do you realize that you can prevent that in the children of the open country if you will see that they get milk and sunshine? Do you know that over in the state where I live, when we made a study of the children in the country, that only one child in five was getting milk to drink and two children in five were getting coffee to drink? We love our children just like you love your children, and on the whole I guess we fairly balance up with you in mentality, and I think we are trying to find out the right thing, but we have failed to pass on our knowledge as we should to parents.

You realize that it is your duty to protect your children, and that that is your real business. If you fail in feeding your hogs, your sheep and your cattle, it is only the pocket book that suffers, but if you fail in feeding your children, you have caused society to suffer. If you don't give them a body that is able to do an honest days work and a brain that is able to think clearly about the problems of the day, then you have hurt society. You have perhaps hurt the world, and you in your real business have to answer to the world if you have not given it physically fit children.

I wonder how many farm men subscribe to a magazine that deals with children? I go into the average farm home and I find at least three magazines dealing with crops and stocks and general farming conditions, but I have not found yet a magazine on a farm reading table dealing with the feeding of children. I wonder if there are not discoveries that deal with children's food and about their habit formation and about their character formation? And, I also wonder if there are not behaviour problems in some farm homes? I wonder how many mothers and fathers know how to meet the problem of adolescence? I wonder if it is not fair to even up in your interest, and in magazine reading, with the activities of your farm life, the concern that you have for your children. That should be your first objective.

I am sorry I cannot discuss at any considerable length the second great objective in your business, and that is, to give your child an education in the country that will make him love the country. I want to know if there is any good reason why the country school cannot teach the cost of crop production? I want to know if there is any good reason why the country high school cannot discuss occasionally the injurious effect of soil depletion? I wonder why, when they are studying mathematics, they don't study farm finance? I wonder if there is any reason why we should not understand the principles that underlie rural sociology? City children need civics. Don't country children need sociology. I wonder if there is any reason for not teaching children about the problems of rural health? Is there any reason why we should not teach them? Hasn't the rural school a duty to perform toward your home in teaching your child to love the beauty of his country lanes, to know the blessedness of seed time and the harvest, to see in winter the miracle that lies there, as well as in the springtime, long for a chance to smell the freshly broken furrow and feel the ground under his feet and do better and more efficient and more understandingly the things of his every day life. I wonder if there is any reason why country schools cannot implant in the minds and souls and hearts of country boys and girls a satisfaction with the things of every day life on the farm? I wonder if it is not possible for you, in your thinking of your real business, to interpret that there might possibly be a wiser expenditure of the family income on the farm? I wonder if farm fathers and farm mothers might not sometime, somehow, find time to play with their children, to help their children and to go out into the world with their children?

I wonder sometimes, when I see the farm homes, if a few more labor saving devices in them might not want to make the children stay there and make life more satisfied and contented? I wonder if there is not going to have to be a better division of the farm income between the home and the farm? Isn't it after all going to be 50-50? I wish down deep in my heart that the family cooking stove could go out every time the family or the automobile goes out. There would be a good many more efficient cooking stoves if we took them out oftener where the public might see them. I have heard a good many mothers say, "Well, you know, we have a new automobile, but what I actually needed was a new cooking stove." Now, you use your cooking stove three times a day, 365 days in a year for twenty or more years, and you know if only the cooking stove could get out of the kitchen and go to a picnic, or if it only could go somewhere where people could look inside of it and see its condition, tell its age and show its service record.

It is also true that sometime we are going to think a little bit more of farm mothers, because no system of education can ever teach to a child what its mother can give to it. Nothing can ever take the place in the life of a child what the mother and father can put there. You don't get standards of life out of a book; you get them from your mother and father. You don't get your ideals of beauty by travel; they are given you by those with whom you grow up.

The men and women of Illinois I know are giving to their real business their standards of life, their belief in the blessedness of country life, country homes and country children. It is not too much to ask that they

shall give to these homes that they have created out of their tears, their sweat and their blood ideals of duty, those standards of honesty and those principles of fair play that make life worth living. I only ask that you will give to the children of this generation what the mothers gave to those men who went overseas. I came back on a boat with 2,500 of them, and as we sailed into New York Harbor, in the shadow of the Statue of Liberty, with the Mayor of New York having sent out a boat to welcome us, playing the "Star Spangled Banner" and our own boat playing "Home Sweet Home", and with every man out on deck that could get there, no word was spoken by a human being, there came the realization that they were home again; home again not to a pile of brick, not to a certain number on a certain street, but they were home again to father and mother, home again to the love that they knew was there, home again to God and country.

That is the thing that is your real business. I thank you. [Applause.]

PRESIDENT ALLEN: Our next subject on the program is "When Town and Country Meet" by Mr. John W. Gorby of the Chicago Association of Commerce.

WHEN TOWN AND COUNTRY MEET.

JOHN W. GORBY, *Chicago Association of Commerce.*

MR. PRESIDENT, LADIES AND GENTLEMEN, MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: This is a very great honor that you do me in this invitation. I am delighted with the opportunity to come here and participate in this good fellowship. I am glad to stand in the presence of the citizentry of Illinois who come from the farm. Somehow or other I feel more at home with farmer folk than I do with city folk. I suppose it is due to my bringing up on the farm. I spent twenty years of my life on the farm and a little more than twenty years in the great city, so it seems to me I am qualified to speak for both sides, but I am frank in saying that I have more good fun among you than among the city folks.

John W. Gorby.

I congratulate you on living in a state like this, and I congratulate you on living in a nation whose farmers are upstanding, patriotic men, none of them members of the peasant class,—thank God.

I have been a little alarmed within the past two or three years. I am constantly studying conditions, and I know my alarm was shared in by other men, patriotic, earnest and thoughtful, for fear that tendencies in our nation today might be in the direction of reducing the dignity and individualism of the American farmer. I believe in God's name that nothing more serious or worse could happen to this nation than that the man on the farm should be reduced in his dignity, in his importance, in his earnestness, in his patriotism and in his capacity to serve this nation as he should. That, my friends, must be preserved as one of the greatest heritages of this Republic, under the flag that floats over our heads. I hope you appreciate the full significance of that statement.

Now, I have a very interesting subject, a most interesting subject to deal with tonight—"When Town and Country Meet." As I sat on this platform I looked around over this fine audience and I had an opportunity to study the peculiar characteristics of the individuals, which I always love to do. This audience has a very peculiar personality. I was impressed first by the beauty of the women here present, and the second thing that impressed me most profoundly is that I don't recall that I ever stood before an audience that had in it so many homely, baldheaded men. Now, I wonder if you know the cause for the disappearance of hair from the top of

the head? Have you ever looked into the subject? The scientific reason I am informed for the disappearance of hair from the top of the head is the intense activity underneath the surface. Now, I am not sure of the truth of this next statement, but I have heard that that is the reason women don't have hair on their chins. Of course, I cannot vouch for the truth of that; I merely heard it.

I was speaking in Spokane, Washington, not long ago, and when I addressed myself to that feature of the lecture, a man with a very handsome pompadour arose in the back of the house and stood there conspicuously, so I asked him if he would not mind standing there for a few minutes, and I would be much obliged to him. I have a friend in southern Indiana who is bald, but a brilliant man. The two don't always go together, but sometimes they are found together. I asked him the other day to give me a story in behalf of the baldheaded man. He said, "I will do that, because I am interested." He said, "You know perfectly well when they exhume bodies you will always find that the hair has grown very profusely, which shows that the deader they are the more the hair grows." Well, when I got to that point my friend in Spokane got under the table. [Laughter.]

As I look over this audience I am interested in another feature. I want to know just how representative this audience is of the great state of Illinois. How many farmers have we here from Cook County, Illinois? Thank you. I am glad to see Cook county represented. Now, how many farmers have we here from the county of which Cairo is the center? None from that end; I am sorry. Now, how many from out near Galena? That is good. I just wanted to see how representative this body is of the State of Illinois. Now, let us see how many people are here from the city of Paris and this county. That is fine. After this meeting is over I am going out to see the sights of Paris.

Now, I have had pleasure all my life in comparing the city man and the country man, and I want to second most heartily that part of the preceding speaker's message where she emphasized their importance of bringing the child up with all the advantages of health and education. I want to re-emphasize that feature from the standpoint of the great city of Chicago, and Chicago is just as much a part of Illinois as you are; and Chicago is destined sooner or later to dominate politically, socially and numerically. Now, I saw a head shake back in the audience. Let me tell you, my friends, what a citizen of the state of Wisconsin said the other day. At the annual meeting of a retail association in Milwaukee the discussion came up as to building a new home for them in the city of Milwaukee. A committee was appointed to look into the proposition and after several conferences they said that they were unwilling to build a permanent home in Milwaukee, because in fifty years Milwaukee would be a part of the city of Chicago, and by that time Chicago would have a population of 50,000,000 souls. Those were Wisconsin people talking.

I have come to the conclusion, after studying the city and the country man, and their respective characteristics, that the difference is one of environment almost altogether. If you had spent your days in a crowded factory in the Central Manufacturing District of Chicago or in any of the other great districts, where day after day the sunlight never came to you, you would be an entirely different man today. You would have a different outlook on life. You might be a communist, saying that all capital must be abolished, and you would be entirely different from the ruddy cheeked, big souled, high character man that you are today as I look you in the eye. Environment makes one man this and the other man that. Environment is perhaps the greatest force in shaping us what we are. So, after twenty years of experience around the great city and more, I have come to the conclusion that the men in the city are just as smart as the men on the farm, and no smarter, and that the men on the farm are just as smart as the men in the city, and no smarter; that the best of the two are about equal, and that the poorest of the two,—well, I don't know what to say about them. I think I can outdo any rube that you can marshal out in

the country. I can pick out rubes on South Halsted street that will beat anything you can summon, and I challenge you to that effect tonight.

The other day we put a woman on the stand in Chicago, on the witness stand, before the court, and the lawyer asked her "how far do you live from where this crime was committed?" And she told him "A few blocks." Finally he said, "How far is it to the lake from where you live?" And she said, "What lake?" And she swore she lived in Chicago thirty years, and didn't know there was a lake anywhere around. Can you beat that?

One of the great problems with men and women of our time is that we fall down on constructive imagination. The biggest thing after all is the human soul. It is bigger than land, bigger than gold resources. I am so glad that the preceding speaker gave me that text. The biggest thing after all is the human soul. Why, who would have believed it that 120,000,000 of people would pause in their selfish endeavors and concentrate their earnest thought and deepest emotion to try to get one little Kentucky boy out of the cliff under which he had crawled. The heart of this nation was touched and $200,000 was spent, which had been gathered by public munificence, to try to get one boy out of 120,000,000 out from under that cliff. That shows the power of the American nation to concentrate on the value of a man. Wonderful! You can not accomplish these things in a minute; it takes time.

I heard of a farmer once who did not believe in God. Now, there are vot very many farmers like that, but this man was an infidel and boasted of it. And he said, "I will take a field and I will plant it, I will plow it and I will clear it on Sunday; I will plow it on Sunday, sow it on Sunday, cultivate it on Sunday, harvest it on Sunday, thresh it on Sunday and sell my grain on Sunday, and I will show up the Christians that that is all bunk that they believe in. And he did. He did everything he said he would do, and he got the biggest crop he ever got. Then he wrote a letter to the country editor. "God bless the country editors. They do a marvelous constructive work. They hold up the ideals", The country editor published the letter of that farmer in full, but at the bottom of the letter he put this significant line: "God does not settle his accounts in full in November."

PRESERVE THE PUBLIC SCHOOLS.

Where can town and country meet? They can meet first where they ought to meet, in the greatest institution in this world, the public school system of the United States, and above everything else, I want you people on the farm to stand for that institution and preserve that institution; if all else goes down, preserve the public schools and keep it in all its purity as you and I knew it in the old days, only embrace and introduce these fine constructive ideas which the preceding speaker so well delineated.

I am in favor of having the city school boy and the country school boy associate more together and rub shoulders together. There is where the real reforms are made. The communistic representatives of Russia, with a devilish rudeness, have done their best to put their propaganda into the hands of the boys and girls in school, and we up in Chicago have been compelled to send out messengers to pick up this devlish propaganda of the communists in the public schools of Chicago.

When I was a boy in that little red school house in the Ohio hills, I went to school one day and I saw a chart. It was about that long and about that wide, and it showed a picture of the human heart after it had been subjected to the use of alcohol. Then there was a chart that showed a normal human heart. Now, this first heart was a bloody looking thing to look at. I can see it today just as it looked thirty years ago and more. Then there was also a chart that showed a hob-nailed liver. My! That was a horrible looking thing to look at, and to my boyish mind it was a striking picture. Other organs of the human body were also shown. Now, Francis E. Willard put that matter into the hands of the public school children, and when that generation grew up and got their hands on the ballot, how long did the traffic of liquor last? You know how long it lasted. I don't mean white mule. I mean real, honest to goodness Kentucky bourbon. It is gone.

If you put the country boy and the city boy near to each other, and let them grow up together and let them rub shoulders together, you will solve the prejudices of the city and the country man. Don't say it does not exist. I know that you gentlemen don't have it here in this fine church assemblage tonight; I know that you are above that. I am speaking of the less intelligent in your community. You are representative citizens and you are big enough in mind and soul to know the truth of what I say, that the city man and the country man do respect each other, but I am speaking of the other 80 or 90 per cent that the intelligence records show do not advance beyond the fourteenth year in their normal development. I was a country boy; I know what I am talking about. I used to go to the county seat and I would walk along the street in that county seat, and I thought everybody in that town was looking at me. I was very selfconscious as I went to town, and when I met a man on the street and he didn't speak to me I thought he was "mad" about something, and I thought he felt he was above me, and I thought so for years, and I formed in my young life a prejudice against a man in the town; that he was a conceited dandy. We called him a "dude" in those days. I thought he was not in my class; that he for some reason or other solved the problem of living without working, and I had to work, and I had it in for that man, and he didn't speak to me on the street.

Coming down to brass tacks, I found when I became a city man myself, that the man that didn't speak to me, did not even think about me. He did not know I was on earth, and what I had considered as prejudice was my own ignorance. So, our imagination constantly conjures up problems that have little or no foundation. We should try to get the city and the country boy to grow up together.

The automobile has solved the problem in a large measure. It has done a mighty work bringing the man from the town out into the country and the man in the country up into the town. I can cite a story right here which goes something like this: Once upon a time every man took his cross and laid it on a pile with every other man's cross, and there they were, all the crosses piled in one huge pile. They were the crosses of the farmers and merchants and everybody else. Now, the great Lord said, "You can go back and take your pick, and if you see any cross that you like better than yours, you go and pick it out." And the story goes that every man, as he sized up the other crosses, went back and picked up his own cross, having made up his mind that his cross was the best after all.

UNDERSTAND EACH OTHERS' PROBLEMS.

There are disadvantages all over the world. We should study the problems of the farm and the problems of the city. You can't imagine the problems that we have in the great city; problems that never worry you at all, when you consider that we have a first class murder in Chicago every day with its terrible cost to the courts, all coming out of the taxes that we pay into the common treasury. Consider also that a large number of workmen have to ride on stuffy street cars, standing up and holding to a strap for an hour and a quarter to three quarters of an hour before they can get to their job, and then at night going back home the same thing happens. That is only a little bit of the trouble and inconvenience that we have to put up with in the great city.

My point is this: when the city man understands your problem and when you understand the problem of the city man, you will both have more sympathy for each other.

Then again, town and country meet in the market place. Indeed they do. Now, I want to start a little new idea here in Illinois. I have never known it to be tried out. It is a perfect success in California. I am in favor of a county chamber of commerce. You may say, "oh, let the city fellows get together and have their city chamber of commerce." I want you to have a county chamber of commerce, where the farmer can go and sit down and hear the city man's problems and the city man can hear the farmer's problems, and let them sit shoulder to shoulder. With such a gathering you would probably hear the city man say, "Well, how are things going

on the farm?" "Not so well. I lost a cow last night." "How is it in the city?" Well, "so and so broke up last night", and so on. I hope you won't get quite as bad as that broker that was referred to a while ago as a grain gambler. He became such a nervous wreck that he couldn't stand it any longer, and he went out in the country to rest up. His servant went with him, and he left word with his servant that he wanted to get up bright and early the next morning and hunt squirrels. So at daybreak his servant rapped on the door and said "Day is breaking." The broker jumped up and said, "You don't say so. What are his assets and liabilities?" [Laughter.]

I believe there are great possibilities in the county chamber of commerce. What we need is to sit down side by side and understand each other better. I have never seen it fail yet in this great country of ours that where men and women sit down and talk it over together, that things are adjusted. Why, bless you, there would not have been a civil war if the Illinois Central had been doing business years ago as it is doing today. We didn't know the south and they didn't know us. It was a bad situation. They didn't want to know us and we didn't want to know them. And, if it were not for the great transportation systems running over the Rocky Mountains every day, it would not be long before the Pacific Coast would see its best interests lie in some other direction than taking orders from Washington on the Japanese question. We must know each other and country and city people must get together.

I believe, my friends, the great hope of getting together in city and country is in the radio. I don't like to hear so much about laws, but I am in favor of a law that will make every farmer put a radio receiving set in his home. He doesn't have to listen to anyone station if he doesn't want to. One of the pleas of radio is, you don't offend the speaker when you cease listening to him. That puts him in touch with the outside world at once, and every farmer should have it in his home. Nothing will put the farmer in touch with the big movements so much as the radio. That is the wonder of our modern age.

I have given you three solutions, and here is the fourth. I hope I can make you see this point. The city boy and the country boy stood knee deep in mud and blood in France, side by side fighting to preserve that great flag and all that it stands for. The city boy from Chicago, Wall Street, Philadelphia and the far west stood side by side with the farmer boy of Illinois and Kansas in that hell of suffering day after day and night after night, and when they came out of it the city boy said, "Never again will I say that the farmer boys haven't the right stuff in them, because I saw them do it", and the farmer boy who used to speak of the "Dago", the "Wop", the "Greaser", the "Gringo", the "Kike",—all those names disappeared from his vocabulary, because each came out of the lines and proved to be a patriotic American. I have seen them. I have seen them shell-shocked and have seen them lie down their lives for the cause. In that suffering together and fellowship together, men came to know each other, and I have seem them and heard them say repeatedly. "No more will I speak disrespectfully of this or that boy, because I saw them in action, and I know they have the right stuff in them."

WORSHIP AND COMMUNE TOGETHER.

Finally, my friends, I want the churches to take up this spirit. I want the country church to get a little closer to the city church. The city church needs the country church. I amspeaking respectfully when I say that some of the best refrigerating plants in the city are the churches. You can go to the church Sunday after Sunday and hear able lectures. It is recorded that in one of the great churches in Chicago one man by actual count attended church six successive Sundays and never heard the name of Jesus Christ mentioned by the speaker. It was a learned lecture. But oh, the church of God that I knew as a boy was the church where the name of Christ was held aloft, and there I learned to love his name and I want that spirit to survive in our city and country churches, and when that goes, I despair of the safety of that flag, because the two grew up together.

I want to see men from the city and men from the country sit down together and worship God together, and these are the messages that I want to bring to you tonight. Don't let any man tell you that the country man is better than the city man, or that the city man is better than the country man. They are alike except that they have different environments. They all have their woes and pleasures and they all have their troubles and their problems. I want you to appreciate that.

I speak as a representative of the big business man of Chicago when I say to you that, knowing them as I do, they are one hundred per cent men like yourself, with high ideals, and they walk humbly before God and man; they are not looking to squeeze you out of existence any more than you are looking to squeeze them out of existence; there is no prejudice in heir hearts; they are in earnest. They are wise enough to know that the prosperity of the farmer is necessary to the prosperity of the nation, and they will strive earnestly and honestly with you to the end that prosperity may crown all our endeavors. Every sky scraper that is built in Chicago, Peoria, Springfield or Decatur or any other Illinois city, makes your farm valuable; every new citizen that Chicago gets,—and it is getting about 70,000 new ones every year, makes your farm more valuable. Don't you see that your market is growing day by day.

Let me draw a diagram for you, and then I am through. Draw a line 400 miles north from the center of Chicago, and the end of that line rests in the heart of the iron ore district of Wisconsin and Minnesota. Under present, modern conditions, there are three essential foundations for great wealth and prosperity and industrial development. One is iron, one is coal and the other is food. In that territory of Wisconsin and Minnesota there are 75,000,000,000 tons of iron ore waiting to be shipped down the lake. You do not know how much that is. Neither do I. It is an inconceivably great sum, but it has the greatest significance on the future of your farm, don't forget that. Every ton of that iron ore is going to add to the value of your farm. Don't sell it; hold onto it.

Now, turn that radius towards the west and where does that 400 mile radius reach? Why, the great corn fields of Illinois and that great garden spot that we call Iowa, which is able to feed the world. Now, there is your good supply.

Then turn that radius towards the south and what have you? You have the end of it resting in the richest bituminous area in the world, which now produces 18 per cent of the soft coal in America, 238,000,000,000 tons.

Now, what is the answer? The greatest civilization of the world will be developed around the foot of Lake Michigan, and every farm in these middle western states will profit by it. What has made your land so valuable? The answer is, great population. Men, I expect to live to see the day when that black soil of yours is worth in the market $1,000 per acre. I have seen land in Chicago rise from $200 a front foot to $1,000 and even $2,500 a front foot. Corresponding development is going to stretch over this whole territory. And I prophecy that before the youngest is as old as I, you will see that land worth $1,000 per acre. Why? For the reason that land is limited. There is no more land being made, and the world population is growing at the rate of 25,000,000 a year, with so many new mouths to feed and so many new bodies to clothe.

Don't worry about overproduction of food. The population is growing with leaps and bounds and the land is not growing. Put the two together and what is the result? A struggle for land. I have owned land for the last twenty-five years. It is the basis of prosperity.

HOLD FAST TO HIGH IDEALS.

Now, what is the conclusion? The conclusion is this, my friends: other nations have grown wealthy, but no nation as wealthy as this nation is to be. Other nations have grown wealthy and died. Why? Because they permitted other things to crowd out the high ideals that that good woman spoke about in the preceding talk. They allowed those things to die out and man began to worship dollars and wealth more than they did the high ideals of honor and self sacrifice. The Kaiser said, "Don't mind America.

She will do anything for a dollar." That is where he was wrong. Four million men was the answer, and many, including your speaker, were willing to die if the cause required it. We shall continue to grow great as a nation if we continue to be like Abraham of old, who was willing, if necessary, to sacrifice his son on the altar that the Lord had made. And if we do not follow these sterling principles, unless we preserve the high ideals of self sacrifice and honor, we shall go down in history as did the other nations, Assyria, Babylon, Greece and Rome.

I therefore ask you to aid me to hold high the ideals for which that flag stands and floats, the ideals of truth, honor, self sacrifice, love of virtue, because as we preserve them we shall continue to grow greater and greater, wealthier and wealthier, and we shall picture to all the world the country and the city of truth, a country and city not made with hand,—eternal. I thank you. [Applause.]

PRESIDENT ALLEN: The convention will now stand adjourned until nine o'clock tomorrow morning.

THURSDAY MORNING SESSION.

February 19, 1925, 9 o'Clock A. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: We will open our program this morning with a "Community Sing," with Mrs. Gilbert at the piano.

Community sing ..... Audience

PRESIDENT ALLEN: We will now have the Invocation by the Rev. Presley P. Coady.

Invocation.....Rev. Presley P. Coady

PRESIDENT ALLEN: Last night we had a representative from the Chicago Chamber of Commerce and this morning we have with us the Secretary of the Paris Chamber of Commerce. I will introduce the Rev. John Codd, Secretary of the Chamber of Commerce of Paris, Illinois:

REV. JOHN CODD: MR. CHAIRMAN, OFFICERS, DELEGATES, AND VISITORS OF THE ILLINOIS FARMERS' INSTITUTE: I don't want to impose upon your time. I know that you have a great deal of business to get over with and a good deal to do in the three days that are allotted to you, but just at this time I want to bring to you greetings from the commercial, industrial, professional institutions of our city.

We are very glad that you have come into our city and we appreciate your being here. We want that you shall have a good time and a good business session while you are here.

Unlike the speaker of last night, who stated that he had lived all his life and grown to manhood upon the farm and then moved into the big city, I was reared in the city from which he came and knew nothing about the outside of that city beyond its boundaries with the exception of one time when I worked on the farm. When I was a young man, because of the stress of city life and many other things that burdened upon me, I began to lose in weight and lose in nerve and lose in strength until I was a fit subject for a sanitarium, and somebody said the thing for me to do is to go out and work on the farm, close to nature, where you are your own boss, where you don't have to work hard, drink lots of milk, eat butter and fat pork and build yourself up. I went out into Iowa and I got a job from a man who was very kind to me; after looking me over he employed me, and I thought within myself he was the greenest rube that I ever saw in all my life. Well, he sent me to the barn and told me there was a load of hay back there, he wished put into the upper part of the barn. I went out and I worked at it for sometime and finally concluded the job. I came back to him and I told him that I had shoveled all of the hay into the attic of the barn. He laughed at me and turned to his wife and said, "Did you ever see anything quite so green as that city fellow?"

The speaker last night said he hoped the time would come when there would be a county-wide chamber of commerce and that the farmers would have their opportunity in that chamber of commerce. That time has already arrived. The chambers of commerce in the smaller cities and towns are what the farmers make them. The farmers are what the city make them, and the city is what the farmer makes the city, just to the extent that the farmer builds up the little city in his community and the county seat, and to that extent is the chamber of commerce successful.

Sometimes the cities have a hard struggle in rural communities, because the farmers do not do justice to their cities, or to their town, their nearest town and their county seat. I read not so very long ago that the income, the combined net income of two of the largest mail order houses last year, showed a net profit of $23,000,000, which meant, I suppose, a volume of business of over $300,000,000 to each of those two concerns. Add to that the drain upon the city that goes out through the chain stores and through the other mail order houses and you can hardly comprehend the amount, the vast amount of money that goes out from the rural communities in that channel.

Now, if this money were to pass through the legitimate sources of the retail merchants of the towns near where you are living, and the county seats that are yours, then the folks who live in town could give you a much better city and the city could give you a much better chamber of commerce. So I say to you, my farmer friends, when you complain about the things the city does in your community and about the things that the chamber of commerce does and does not do, I want you to think over the condition I have just mentioned carefully.

I greet you this morning and welcome you into our city, first of all, because of what we are. We folks in Paris feel that, indeed and in truth this is the Paris of America, and that we are the hub of the State of Illinois. We are so situated that we are removed from the coldest part of the state; we don't get the zero weather nor the snow banks that they get farther north, and we are removed from the hot sun of southern Illinois and its sands and burs. We feel that we are so favorably situated that we are really the hub of the State of Illinois.

There has gone out from our city some of the greatest men that this country has ever known; they have gone out and carved their names in the pages of history that will stand as long as history stands. By the way, all of our great men did not leave this city of ours, and that is why we can do the things in this city that we are doing and expect to do in the future.

As you see, I am a booster. I believe in a man boosting for the place in which he lives. I believe that every man should boost his own town and his own community, and if he can't do that I believe he ought to live somewhere else. I heard a man say the other day that if he was compelled to live in the lower regions that he would claim it was the hottest fire that ever existed. I believe in boosting for the place we live in, and we have a right to boost, we, who live in Paris, for this city of ours. Therefore, because of what we are and what we have we greet and welcome you to this city of ours, and thus we greet you and welcome you because of what you are and what you represent.

All our thinking America cannot help but admire the devotion, the faith and the courage of the American farmer of today. When I hear men cite tales of the boys who blazed the way through the Argonne Forest, tears come to my eyes because of the hardships they endured, but those who came back in health, threw their uniform under the bed and went out and got a job and have earned good wages ever since. When I think of the men who surrendered vast salaries, men in executive positions, and worked for the government for a dollar a year, I cannot help but admire their devotion and their patriotism, those men whose business was injured because of the duration of the war, but since the war these men, who worked for a dollar a year, they are now again reaping the harvest of large salaries, and business men whose business was interfered with, have gotten back their business and are getting back on their feet again.

For the past five years and over, the farmer has been paying the freight for the world's war and been doing so without any complaint. We admire your courage and your patriotic devotion and your faith in the future. Optimistically, I think you can look out to the dawning of a better day. You men from all parts of this great State of Illinois, this great commonwealth of ours, you have paid the freight in these years past and expect to pay it for a few more years to come, but you can get together and you can plan together for the dawning of a better day when the farmer shall come into his own.

In this I greet you and welcome you in the name of the commercial, the industrial and the professional interests of Paris. We hope that you will have a good time while you are here. We hope that one of the fondest memories in your days to come will be your visit to Paris, Illinois. I thank you. [Applause.]

PRESIDENT ALLEN: We will now have a reading by Mr. Robert Gross.

Reading.....Master Robert Gross

PRESIDENT ALLEN: I am reminded at this time of the story of Pat and his wife. His wife was always telling him how to drive their automobile. So they went out riding one day and they took the priest with them. Pat's wife and the priest sat in the back seat, and she promised Pat she wouldn't say a word while they were out. Well, Pat drove over some pretty rough spots and hit some pretty deep ruts, and finally he heard his wife say, "Listen, Pat, his reverence is no longer with us." [Laughter]

Mr. Mason.

I want to introduce our Vice-President, Mr. Mason. We have a good many men on our Farmers' Institute Board of Directors, and I don't want you to think that I am the only show horse in the bunch; we have a good many of them, and Mr. Mason is one of them. I am going to introduce him to you and he will take charge of the meeting this morning, Mr. Mason:

VICE PRESIDENT MASON: We have in McLean County a man who has had a lot of experience with what we call the McLean County System of Hog Sanitation. He is going to tell you just what he has done on his own farm. I have been on the farm and I can vouch for what they are doing down there. Without any further remarks, I take great pleasure in introducing to you Mr. G. C. Johnstone of Bloomington, who will talk to you.

McLEAN COUNTY SYSTEM SAVES PIGS.

G. C. JOHNSTONE, *McLean County, Illinois.*

MR. CHAIRMAN AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: I think the program says something about the "McLean County System Saves Pigs." Now, it seems to me that this is a timely subject just at this time. all of we farmers are beginning to think about the pigs that are going to come very shortly, and it looks as if for the coming year pigs are going to be good property. Another reason why it pays to save pigs, especially in Edgar County, is the fact that this was the first county, I believe, in Illinois, which was declared a tubercular free area, and as I understand it, the big packers are willing to pay ten cents per hundred more for hogs

which come from a free area. Now, that is an additional reason why pigs should be saved—they are worth more in Edgar County than they are in any other county in the state. We in McLean County hope to be able to cash in on that proposition shortly. We are going through with our second test at the present time.

G. C. Johnstone.

Now, I don't want to convey the idea that this is a scientific discussion of the McLean County System. I prefer to talk from the viewpoint of our personal experience with the system, and I want to tell you also that it is not my business to do public speaking. I just want to discuss this proposition with you as though we were out on the farm, out on the hog lot.

The McLean County System of Swine Sanitation was, for the first few years, rather a local project, but in the last two years it has become a National project. In fact, inquiries are coming in from every part of the United States and Canada where hogs are raised. There seems to be a great amount of interest.

HOW THE "SYSTEM" DEVELOPED.

It probably will be of interest to know something about the history of this system, how it came about, and so forth. Dr. Ramson, head of the Bureau of Animal Industry, United States Department of Agriculture, and Dr. Raffensperger, are probably responsible for this system. They spent a great deal of time studying the round worm in hogs, pigs particularly, as pigs seem to be much more susceptible than older hogs. They were particularly interested at first in finding out the life history of the round worm. You know, most animal parasites have what is called a host in which they spend part of their life's cycle; their experimental work in the laboratory proved this was true of the round worm, and their experimental work also proved rather conclusively that the round worm developed not in a separate host but wholly within the pig. In other words, it had no intermediate host. They found that in all probability the pig picked up the round worms from old, contaminated lots, entering through the mouth. These worm eggs were taken into the stomach and intestines and in a few days they hatched into very small worms. These worms are practically invisible to the naked eye; they must be put under a microscope to be seen. However, these very small worms make their way through the walls of the stomach and the intestines into the blood stream of the pig and finally reach the lungs. They remain in the lungs for some time. While in the lungs they create a lot of trouble. They irritate the lung tissues and lacerate the lungs, and at this time also the pig shows symptoms which are very similar to cholera and hemorragic septicemia. Prior to this experimental work many have diagnosed a case of this kind as something else, and it was treated accordingly and of course, with no results.

From the lungs, the young worms pass on down into the mouth and are again taken into the stomach and the intestines where they develop into adult worms. That is the cycle of the worm in the pig's body. After these worms grow to maturity they are expelled with the manure, and it is known that some of these adult worms contain as many as 80,000,000 eggs. Now, these eggs are the source of probable infection to other pigs.

There is a step right here that is important in the plan. These eggs, if immediately picked up by other pigs, will do no harm, for the reason that they must incubate before they will hatch when taken into the stomach of another pig. That period of incubation may be from several weeks to several months, depending on weather conditions, temperature and other things. We used to think that if our pigs got wormy we could give them some worm expeller and get rid of the worms and probably

most of our trouble would be over, but we have learned that it is not in the adult stage in the intestine that the worm really does the most damage; it is in the lung stage. If these little worms are numerous enough they lacerate the lungs and irritate them in such a way that they are very susceptible to a secondary infection, such as pneumonia, other diseases of the lungs, and things of that kind. Dr. Raffensperger and Dr. Ransom think that a great many of the runty pigs which we have are due to that rather than to the damage which these adult worms do in the intestine stage.

There is no remedy for these worms when they get into the lungs. Now, with that idea in mind, they worked out this system, which in reality is very simple. It simply keeps the pigs away from the source of infection from the time they are born until they are resistant enough so that the worms don't seem to have any effect on them. You know when a scientific man works out a lot of experimental results, they look as though they would work well in practice, but some of them don't; in fact, scientific theories many times fall down when they are put to the test in the field under practical conditions.

Now, after they had developed their plan, the first step was to try it out under field conditions. So, in the summer of 1919, Dr. Raffensperger arranged with the McLean County Farm Bureau to interest some of its hog men in raising some pigs under this system. There were about twenty men who responded and agreed to try it out. As is usual in these cases, some of the men followed directions and some didn't; and, I might say, the ones who followed directions exactly and carefully, got practically 100 per cent results. The ones that didn't follow directions got results just about in accordance with how closely they followed them. In other words, every step helps a little probably, but it takes the whole combined number of steps to really produce results. The same is true of a great many men that want to grow alfalfa. A lot of men want alfalfa all right, but they don't want to take the necessary precautions before planting the alfalfa to get a proper stand. It is the same proposition in the hog business.

I saw a little clipping the other day from Mr. Robbins over at the University, and he figured out that if the eggs of these worms were as large as a grain of corn,—and I told you before they were microscopic in size, that on most farms where the hog lots and pastures are about five acres in extent,—I think that is about an average,—that he thought most of these lots would be covered about fourteen inches deep with worm eggs. I don't know how he arrived at those figures, but I can imagine that some of these old, dilapidated hog lots would be about that deep in worm eggs.

IMPORTANT STEPS TO FOLLOW.

Now, just what steps are necessary to be taken to follow out the directions of the system? In the first place, the first thing to do is to clean out your farrowing pens thoroughly. First, throw out all the dirt and filth with a scoop shovel and then take a flat spade and scrape out all the manure that is left and the mud that adheres to the floor and the walls and brush and sweep it out. After you get out as much as you can by that process, take some boiling lye water and scrub it out, also up the sides for a foot or two.

These worm eggs are peculiar things. They are resistant to practically all the common disinfectants which we use. In fact, they will live for months, they tell me, in formaldehyde as well as dip. Anything of that kind is not destructive to them. Practically the only thing that destroys them is boiling water. They seem to have a hard shell which the boiling water dissolves. The lye cleanses and kills other disease germs and lice and things of that sort in the pen. We take a can of lye to about ten or twelve gallons of water, and ordinarily it takes about a bucket full of that solution for a 6 x 8 pen to give it a good, thorough scrubbing.

The next thing is to wash off your sow. Most of our brood sows are traveling in old, dirty hog lots where hogs have been kept for years, and along about this time of the year the udders of those sows are more or less covered with mud, and in that mud adhering to the teats of these sows

there may be hundreds or thousands of these little eggs, and then what happens? Why, the first mouth full that these little pigs get is contaminated with hundreds of these worm eggs, and he gets a bad start right from the very first mouthful; he has started down hill, you might say.

A lot of people think it is an awful job to wash up these sows. If you have these sows in a proper place, and you have a runway, a chute and the bottom boards are high enough so you can get under there to wash off your sow's udder with soap and water, it is not such a hard job after all. A small pen is very good. Some people get the wrong idea; you don't have to wash them off with dip. One fellow wrote in one time for a solution of lye to wash them off. Just use warm water and soap. I have found that soap and water is a whole lot better than anything else. Now, if these sows happen to be very muddy, we take a curry comb and brush them off first. Our sows usually follow a bunch of cattle, breeding cows, and they are pretty muddy. However, you can do this very quickly. A couple of men that are used to do this job can run through eight or ten sows in an hour or an hour and a half, something like that. It is not a big job really when you set out to do it and are prepared to do it.

After these sows are cleaned, they are put into the clean pens. They are confined there and not allowed to get out until the pigs are preferably two weeks old. We do have to get some out sooner, because we have other sows coming in, but we prefer to leave them there until they are about two weeks old, and then they are moved out into individual houses on a clean pasture.

Now, you may think when I say "individual house" that I mean we put only one sow in each house! We have some houses where we put three, or four, or five sows, according to the size of the sows and the house. You have heard a good deal about separating pigs into bunches of fifteen, or twenty. Now, that sounds all right, but if you have very many of them and you haven't any hired hand, it is a big job. A year ago last fall we raised 190 pigs all in one bunch in individual houses, and this year we had 130 all in one bunch. These pigs were not uneven. I believe that under this system you can do that. They came along fine and they don't seem to crowd each other and have all the things that we hear about.

The directions say to haul these sows from the farrowing pen out upon the pasture. We vary that somewhat. Of course, the whole object in hauling these sows is to keep them from traveling through a filthy lot and contaminating their udders again with mud, and so forth, that contains worm eggs. If we can get this sow out of her farrowing pen and drive her where it is not muddy, we do that. You just have to use your own judgment about that. It is much easier to drive them than to haul them, but, if I had to take them across an old hog lot, I would certainly haul them, or build a bridge over it.

The next step is a step that we have been taking and I think is well worth while. After we get the sows in the clean pens, we take a brush, or spray pump, and spray them or brush them with crude oil or old tractor crank case oil, or something of that kind in order to kill all the lice and nits. Now, your pens are clean and your sows are clean and you are going to put your sows in clean pasture and there is no opportunity for the pigs to become infested with lice. You know how it is when they are lousy. You figure you are going to do it now, or tomorrow, and you just don't do it; and, I am telling you, that lice on young pigs is certain to retard their growth to a great extent. We have put pigs out on the pasture, put them into the corn field and later shipped them to market, and I have examined them and I couldn't find a louse. They didn't have any lice because there was no place to get them. They usually pick up these lice from their mothers in the first place, or in old buildings or straw stacks or something like that, but if they don't get a chance to come in contact with lice they are not going to have any. I think that is a step well worth while. It doesn't take but a little time and it saves a lot of work in the future.

One of the things we have to get away from, of course, is labor and management of taking care of these pigs. I expect the uppermost question in all of your minds is, does all this pay? Does all the extra expense,

extra labor and extra management pay? Will I get repaid for it? Well, we have now raised eleven crops of pigs under this system with five and one half years experience, and we feel that it does pay.

RESULTS OF THE "SYSTEM".

First, I want to tell you a little of our experience before we began to practice the system. Prior to 1919 for several years our hog business had been unsatisfactory, and, worse of all, unprofitable. It absolutely figured up in the red. Now, we either had to change our system, get better results or quit; that was all there was to it. We liked the hog business. The farm plan had been built up around the hog business and we didn't want to quit. Well, we tried worm expellers, tried bacterins, sanitation such as we had been taught, filling up the muddy holes, scattering lime around the lots and all those things, and we did that conscientiously. We fed balanced rations, we used well-bred sows and still we didn't seem to be getting any place. I think we had every pig trouble that was in existence. We just had a combination of everything. In fact, I might say, the farm which I operated was taken up from the government and there probably have been hogs centered around there ever since. We had good litters, and they would go along to just a little before weaning time when they would begin to go backward. Their hair would begin to stand on end and their backs would begin to hump, and the underline would correspond with the top line, get elephant-hided, wrinkled and tough. Not such a large number of them actually died, and they would continue to eat well, but they would not grow and would not put on any gain. They were just simply a money losing proposition right along.

Prior to 1919 the number of pigs which we could raise from a given number of sows was just a guess. We might raise a good average, or a very small average. As I say, the ones we did raise were unprofitable because they were not good doers. Dr. Raffensperger approached the McLean County Farm Bureau in 1919 looking for some co-operation along his line of work in the eradication of round worms in pigs by putting the plan into actual practice upon the farm. We were one of the ones who volunteered to try out the system, and we were good and ready to do it. We were very particular to try and follow directions exactly. Now, after the first crop we were very much surprised in our results. We hadn't had a bunch of pigs like those for years. We found out also that we had not only eliminated worms from the pigs, but we had eliminated all the bull nose and the chronic enuritis and general unthriftiness, and we eliminated practically all of our runts. We thought it was an accident, but I might say, it proved to be not an accident. It was simply the results of following out the suggestions which had been made in the beginning.

We were not the only ones. There were other men who followed out the directions practically as they should and got the same results. Others, as I said a while ago, got results according to the exactness with which they followed instructions. Some men would wash off their sows and put their sows in clean pens and then they would let them come back into an old lot to get water. Those pigs were not as bad as some that were raised on an old lot, but a good many of them want bad. Some drove their sows through the old lots. Their pigs were fairly good but they were not what they should have been.

Now, what results have we obtained? In the first place our pigs are ready for market a great deal sooner than they were before. They are much evener. They come along more uniformally. We have had practically no disease. Of course, we have had a pig now and then go bad and we have had a few worms along, but they are not in large enough numbers to create any loss which really amounts to anything. We have used no worm expellers of any kind since 1919. We have had attacks of flu, but I might say that I am confident that those attacks have been much lighter since we have been practicing the system than they were before, due, we believe, to the fact that the pigs are more resistant to the disease, due to the fact that their lungs are intact and the passages of the lungs are not stopped up as

these pigs were after an infection of worms or a secondary infection, and they seemed to recover with much less shrink and more quickly.

We did not have any exact records prior to 1919 of the number of pigs raised. Since we have been co-operating with the Bureau of Animal Industry they have had a man in charge who has been keeping records. Since 1921 we have never marketed less than an average of six pigs per sow. In other words, if we want to raise a certain number of pigs, we have a very definite idea of about how many sows we will have to keep, how many sows we will have to breed, and in that way it is a much more satisfactory business. You can also plan your business much better. You also know how to take care of your feed requirements, and it is a much more satisfactory business as well as a more profitable business. We have had no mangy, unthrifty pigs in all that time. You know that after a while you sort of raise your standard; when you keep improving and improving you raise your standard each season. We have had two or three tail enders in our fall pigs and Dr. Raffensperger would say, "You call these tail enders because you are getting too high in your ideals." Their hair is good and they will make good pigs just the same.

Now, as I have said, we have been able to raise never less than six pigs per litter on the average and have raised as high as seven. We have also been able, according to the records, to put 6.7 pigs per litter upon pasture, that is, after all your loss in the farrowing house. We do not attempt to put any pigs on pasture that are not strong and look as though they were able to go along with the rest of them, because we found it is much better to knock them on the head or something like that. One that has been crowded out and has every evidence of not being able to fight its battle with the rest of them, we get rid of.

Q. How old were the pigs when you took them out?

A. I would like to have them two weeks old, but we have put some out when they were a week or ten days old because we were crowded for pens. I would not put them out so very young.

Q. What time do you put the pigs out in the pasture?

A. Our pigs are usually March farrowing; some put them out in February.

Q. What kind of a pasture do you put them on?

A. I like to have alfalfa and timothy pasture.

Q. There would not be any that early, would there?

A. Well, very shortly after March there would.

Q. What do you feed them?

A. I would prefer to wait until I get through and then answer any questions you have to ask.

LOSSES LARGELY ELIMINATED.

We have been able to raise 96 per cent of those pigs which we put out upon pasture. The losses which we have had were due mostly to accident, not from disease; sows lying on the pigs or pigs getting fast under the houses or in the fence, or something of that kind. One time we delayed vaccination and lost a few. These records that I have given you were from 214 sows and 1,440 pigs. These were the number of sows and pigs that were directly under Mr. Conley's supervision.

Now, I might say in conclusion, that we feel that a great deal of the guess has been taken out of the hog business for us by this system. I feel that the system plus immunization has made the hog business a very safe proposition to what it used to be. We are confident that we can take one half of the number of sows which we had before, or which were being handled under the old methods of letting them run over old lots and letting them eat any old thing, that we can take half of the number of well-bred, well-fed and well-managed sows and get more net profit than before. I don't think there is any question about it.

Now, I will be glad to answer any questions.

Q. After this long period, haven't you got your farm pretty well cleaned up with these worms?

A. Yes, we have, but at the same time we have cattle lots that are pretty hard to do anything with; in fact, we haven't attempted to do anything with them.

Q. How long do those eggs live?

A. That has not been exactly determined. As I say, they have been known to live for a couple of years.

Q. You have been at it nine years, you say?

A. No, five and one-half years, and have raised two crops a year.

Q. Do the eggs live in the sunlight out in the pasture?

A. Yes, sir, they will. In fact, it takes a real warm temperature for incubation.

Q. Will the pigs that are clean get the infection from the ones that are left dirty?

A. Well, if the pigs rob each other they might.

Q. A person would hardly gain anything unless he entered the system wholeheartedly, is that your idea?

A. Understand, you will get a good deal of benefit by putting your sows out on a clean pasture even if you don't wash them, but I tried to make plain that your success will be in proportion to the exact following out of the instructions.

Q. At what age do you vaccinate these pigs?

A. We never have vaccination until after weaning. For one reason, we take out a good many of these pigs for breeding purposes. I am running a strictly market bunch, and I am breeding them now for June pigs. I am going to vaccinate them before I take them out of the pen because they are all going to market and there is no question but what they will hold immunity that long. There has been some question if they would hold their immunity when you keep them for breeding purposes for several years.

Q. Do you give them the double treatment?

A. Mr. Brown has been doing that for two or three years and he is getting good results.

Q. How many years would you wait before you would let pigs back onto a field that had been contaminated?

A. If I had an old lot which I felt was badly contaminated, I would want to raise a couple of crops, growing crops, before I would put the hogs back on it; but, where you have a clean pasture to start with, I think one crop, of some kind of grass crop, would be sufficient.

Now, we haven't been able all this while to have ideal conditions. We have put sows and pigs back onto the same pasture, which was a clean pasture in the beginning, three successive times; but, the pasture was rather large. We had the houses over on one side of the pasture one time; we had them over on the other side at another time and over on another side the third time, and in that way the sows and the pigs were not congregated on any one place more than once, you understand. They might have gone over to the other places at some time or another, but they wouldn't stay around there; there was no reason for them to stay. Pigs usually stay pretty close to where the houses are and where you are in the habit of feeding them. At the present time we are arranging to have a number of small fields close in that we are going to keep clean.

Q. What percentage of your farm area goes into the hog pasture rotation?

A. That is pretty hard to say. We run them pretty well all over.

Q. You use the entire farm?

A. Yes. Some of it is not hog tight, but I might say we probably have fifteen or twenty acres devoted to small pasture which we use for calves and milk cows and we get some alfalfa hay off of it so that the hog pasture does not cost a whole lot.

Q. Is there a termination of the period of possibility of infection?

A. Yes. I neglected to say that. At the end of four months they usually go along without any further trouble.

Q. The lung is the only place of incubation, as I understand it?

A. No. They incubate in the intestines and the stomach. These small microscopic worms make their way through the walls of the intestines and

the stomach into the blood streams and finally reach the lungs in the larva stage.

Q. Then the cycle must go through the lungs?

A. Oh, yes.

Q. Do you disinfect your troughs all the time?

A. Not particularly. We never felt there was much danger there from a worm standpoint, you understand.

Q. Have you had any experience with individual sleeping quarters, or individual pens?

A. You mean out on the pasture?

Q. Out on the pasture, yes.

A. Yes, sir. We have been using those all the while. Of course, there are a lot of different styles. The main object is to get them as cheap as possible so that they will answer the purpose. I think about as practical a house as we have found and the least expensive is a building about 7 x 14 with runners, three boards high in the back and four boards high in the front, and we have found that they are economical too. They also have fir roofing. Paper is not satisfactory. You can put five gilts in a house like this, and if you have old sows with large litters, about three. It depends on how your sows farrow and how crowded you are for space.

Q. Do you floor these houses also?

A. In some we have floors and in some we haven't. It makes them more expensive to put floors in. I like floors a little better because you have a better opportunity to clean them, the same as your farrowing pens. A house without floors you simply spray with crude oil, and that is about all you have to do. However, a house without floors requires lots of bedding.

Q. What were the dimensions of the house?

A. The large houses are 7 x 14, with a door in each end of the house.

Q. What is the size of your smaller houses?

A. The small houses are 6 x 8 feet.

Q. You had no partitions, did you, when you had the seven sows?

A. We didn't have seven; we had five gilts. We take these gilts that we are going to put in the same house and turn them in a pen before we take them out in the pasture, and if there is any fight in them they usually get it out before we take them out there.

Some of you may not believe it, but these pigs are able to find their own mother. If we have pigs of different age we sort them and keep them together as much as possible.

Q. Is your plan spreading throughout the county? Are the neighbors accepting it rapidly?

A. Not so rapidly, but they are all beginning to want to know more about it. Mr. Conley has had about thirty men co-operating with him this last year and there were a number of others who were practicing the system more or less. There is more interest manifested right along, and the University is taking it up as one of their main extension projects this year.

Q. How close do you set your houses?

A. If they are about the same size we put them fairly close, and if we have a bunch of pigs in the same field that are older we try to put those houses further away so the older pigs will not have to go past the younger pigs' houses. The chances are they will not find those houses for sometime and the young pigs will stay around their own houses, and in that way you are able to keep them sort of colonized.

Q. In these 7 x 14 foot houses, do the little pigs have any trouble in finding them?

A. I don't know. We just let them go. That is all you can do. I would rather have them running around in a clean pasture than around a dirty hog lot. We have only lost 4 per cent in nine crops, not counting the farrowing.

Q. It looks to me that your average was not so good when you only got 6.7 per cent per sow?

A. Well, there is nobody getting any more. That is for nine years, you understand. We have all the way from 6 to 8, but that is the average for nine years on 214 sows.

Q. What about locating sows in a field where you have a bunch of spring pigs?

A. Well, you have to do the best you can, that is all.

Q. What kind of hogs are you raising?

A. We are raising Durocs.

Q. Is there such a thing as one breed being better than the other.

A. Well, I don't care to go into a breeding discussion here.

Q. You like a pasture of timothy and alfalfa, you say?

A. Yes, sir.

Q. How about sweet clover?

A. That is all right early, when tender.

Q. Some gentleman raised the question a while ago as to your average being low. The state average is about four, isn't it?

A. I don't think you will find it is even 4 per cent.

If there are no further questions, that is all I have to say. [Applause.]

VICE-PRESIDENT MASON: Mr. Fahrnkopf, will you please come forward and tell us what you know about hog sanitation?

MR. FAHRNKOPF: Mr. Chairman and Gentlemen: I think the subject has been very well covered, Mr. Chairman. I have seen Mr. Johnstone at work at home, but I never heard him speak away from home, so that was one reason I came here to see him in action before an audience. I don't know of any man who is better qualified from the standpoint of raising hogs than he is. Last summer Dr. Raffensperger figured up the number of pigs raised, the number of sows raised, the percentage farrowed, saved, lost, and so forth, and he made the remark that he didn't know of any case that paralleled Mr. Johnstone's record of all the records he was keeping. I am simply telling you that because he is a man that works at the business and he has not only followed the system very closely, but he knows and works along the lines and principles of breeding and feeding.

I don't know of anything to add further in regard to the subject or cover it any more in detail than it has been. The remark was made here that they thought the average was a little low. There is just this one thing about averages to be said: When you average things, you want to average all of them, and if you keep your records over a period of years on what you are doing, and actually put in there the things you don't want to put in, as if you were putting them in for your worst enemy,then you will be doing justice to your average.

Mr. Johnstone said something about 25 or 30 men co-operating with the Bureau. I want to say this, that when the United States Department of Agriculture puts on a program, they get certain men to promise definitely that they will co-operate with them, and these are the men on whom the records are kept over a period of years. There are hundreds of men trying it out who don't get anywhere, and there is no record of those men, and then again there are hundreds of men that have not paid any attention to the system. I think that is a point worth mentioning. When you hear these averages mentioned, you can take it for granted that the good is thrown in with the bad, and that on the whole they are very fair.

In closing I might say that if you are farrowing a large number of hogs, it will work in with your major rotation of the farm. I thank you. [Applause.]

VICE-PRESIDENT MASON: We will next have a very interesting topic, "Fundamentals in Dairying", and I take great pleasure in introducing to you Prof. R. E. Caldwell of Waukegan.

FUNDAMENTALS IN DAIRYING.

PROF. R. E. CALDWELL, *Waukegan, Illinois.*

MR. CHAIRMAN, LADIES AND GENTLEMEN: I am sure you all appreciate as we take up item by item the study of live stock, that it is indeed getting to be a problem of handling details. It seems that every time you hear a speaker on hogs, cattle feeding, poultry raising or dairying he is outlining still more and more technical details to be taken care of in order to be successful in that line of endeavor. So, it is not particularly to be wondered at that some are growing discouraged in the live stock business on account of that burden.

Prof. R. E. Caldwell.

I was very much interested in the talk just given by Mr. Johnstone on the hog subject, but it seems that an intimate and detailed knowledge is necessary in that as in all other lines of work to be most successful.

Now, I don't know how many here are from what we term the dairy districts of the State of Illinois. Illinois was blessed by the Maker in such a way that we have almost too much good soil to develop good dairymen. Dairymen do not seem to grow on the best soil—they usually grow in poorer areas. So, I may not be speaking here this morning to a very large audience from the standpoint of dairy interests. However, I am going to take up the subject as indicated and touch briefly on some of the fundamental points of dairy farming that have been worked out by those who are most successful in this line of work.

The growth of the dairy business in any one country seems just about parallel with that in any other country. In every new country you find people who are, seemingly, you might say, lost in the maze of dairy effort—they don't seem able to find or work their way out. Still, if you go into any old dairy country and study the methods that have been used you will find that all successful dairymen have almost always followed the same general principles.

HISTORY OF THE BREEDS.

As a foundation upon which to place all arguments in this connection I am going to discuss just briefly the history of the dairy breeds. We have five major breeds of dairy cattle: The Jersey, Guernsey, Holstein, Ayrshire and Brown Swiss. Each of these breeds has been bred and developed for centuries with one purpose in mind, viz., the production of the largest possible quantity of milk and butter fat. They are exclusively dairy animals.

Take the Jersey cow, for instance, one of the most highly intensified breeds of dairy cattle that we have. They come from a little spot of land known as Jersey Island, a tiny island south of England and north of the coast of France, about the size of one of your Illinois townships, approximately six miles square, or about forty square miles of land. On that island they have from 7,500 to 10,000 cows which are the results of a selective method of breeding practiced there generation after generation, generation after generation. About 130 years ago there was a scourge of Foot and Mouth Disease in France, and this little self-governing province passed a quarantine ruling stating that from thenceforth and forever no animals would be brought into the Island of Jersey except under government supervision and then only for slaughter within twenty-four hours. That rule is still in effect and has resulted in the cows of the Island of Jersey being protected from a plague that threatened them almost a century and a half ago and which every once in a while threatens the cattle of this country. Now, these people from the Island of Jersey have been breeding construc-

tively because they have watched two very fundamental points and have followed simple methods that will be discussed briefly later on.

If you go to Scotland you will find in the development of the Ayrshire the same type of procedure being followed. Go to Holland and you will find the Holstein cow raised on land worth two or three thousand dollars per acre, that is, up in Friesland which is below the Zuyder Zee where they pump the water from the valleys over the dykes into the sea. This land will grow a little grass and grain but the people in Holland come to America and buy our oilmeal and cottonseed meal and gluten feed, pay freight on it to the seaboard and ship it to their own country where they feed it to their Holstein cows on this high priced land. They milk these cows, convert the product into cheese and butter and ship it to our American shores, pay the import duty and beat us at our own game, simply because they have made use of a good cow. They would not keep poor cows, but are willing to keep good cows on high priced land, feed them on high priced feed and make a product that is a quality product from a quality breed and cater to a quality market. So much for the general history of those breeds as it relates to the background of the animal.

Our first settlers in the United States were grain producers. Up in New England they grew grain, robbed the soil until it would yield no more, and then moved west and the live stock men stepped in behind them. Then the grain men depleted the soils to such an extent through Ohio, Michigan, Indiana and Illinois that they had to move on further and so on until today the grain farmer is standing with his back against the Rocky Mountans making his last great stand in America. Following him has come the hog man and the beef man and as the centers of population have increased and it has become necessary to produce more and more food per acre, the dairy cow and the old hen have finally come into their own.

This great procession, the grain farmer, the beef man and the hog man have marched across the country. There are left a few of each type in each community. We have in the State of Illinois all three types. We still have a lot of grain farmers and a lot of beef men which we want to keep until our population becomes too great, and in our centers of population we have a great dairy industry.

ESSENTIALS IN BUILDING A DAIRY HERD.

In building up a good dairy herd there are several points that must be observed. In the first place, choose the breed which you believe will best suit the purpose you have in mind, choosing, of course, one of the improved dairy breeds. Then select the highest grade cows in that breed that it is possible for you to secure. If you can secure pure bred cows so much the better although it is not necessary. Never try to make use of cows of cross breeding such as a Jersey-Holstein cross or a Shorthorn-Holstein cross—not if you want to build up a dairy herd. Also, never make use of a dual purpose animal if you want to build up a dairy herd. I knew of a man once who claimed that in twenty-five years he would have built up the finest herd of dual purpose cattle in his home state. At the end of the twenty-five years he had one of the finest herds of Red Holsteins from his Milking Shorthorn start that I ever saw. However, he could have started out with Holsteins and had at the beginning just as good a herd of them as he had actually at the end of the twenty-five years. In other words, it is practically impossible for a man to take a dual purpose herd and maintain standard types. You will have preference to beef or milk, and whichever way your preference goes, that is the way your herd will go. Therefore, always make use of one of the improved dairy breeds.

The next point is—don't mix breeds, for the mixing of breeds is one of the most destructive, commonplace, everyday acts in the destruction of a profitable dairy industry in the State of Illinois. Insist, as you go to your various districts, for you men are leaders in your various communities, the stocking of pure lines of breeding, because the violent interchange of blood will sooner or later weaken that sterling strain with which they were first imbued. In purchasing cattle, insist that they be offspring of a pure bred bull and a tested dam. Always be sure to breed your cows to pure

bred bulls as that is the only efficient way to build up a highly productive herd.

There is one thing I very often see in this State of Illinois which may hit some of you a little hard. I find dairymen up and down the state bringing their milk or cream to town, getting their checks, going to the grocery store for supplies and including among same three to five pounds, as the case may be, of oleomargarine. Now, as dairymen, as farmers, as human beings, we are all prone to criticize. We like to sit on the soap box and criticize politicans and the government in general, we like to be very critical as to how the big business man runs his business and how he is hogging us at every turn of the road. Still, I can take you out and show you thousands of dairymen who are supporting an industry which is the greatest underminer of their business and their greatest competitor—the oleomargarine business. If we are going to criticize, let us start at home. While oleo contains material that produces heat and energy, it does not contain that growth essential, or vitamine, which is found in butter fat. If you feed your children oleo in place of your own product, butter, you are simply undermining their health and handicapping them for future usefulness. Don't be afraid to use the things which you produce. Also, don't support the biggest competitor of the dairy industry, the oleomargarine manufacturer.

The vitamine, mentioned above, is one of those food essentials that we are hearing so much about today. In fact, a great deal is being said about them, Vitamines A, B, C, and D. Vitamine A is the soluble element of butter fat, Vitamine B the water soluble, Vitamine C green material and Vitamine D is a new thing that has just been discovered within the last year. It is known as the Antiarchitic Vitamine and is formed only where there is direct sunlight either real or artificial. Many wealthy families who have their children playing in luxuriously constructed sun parlors instead of allowing them to play outdoors in the direct sunlight wonder why such children should be afflicted with rickets. They are given nourishing food, prepared in just the right way, but still they seem to be undernourished. A great many experiments have just recently been conducted both with children and with animals and it has been proven quite exhaustively that it is the element contained in the direct sunlight that aids the body in assimilating food elements. The university of Wisconsin recently conducted an experiment results of which showed that over fifty per cent of the wealthy children tested showed that they were afflicted with rickets while only ten per cent of an equal number of poor children examined showed the presence of such a disease. Ordinary window glass has a faculty of absorbing the ultra violet ray from sunlight, it being the ray carrying this wonderful element, so by the time the sunlight has passed through the glass windows of a sun parlor it has lost its curative or health-giving power. But the poor children who play out of doors most of the day every day receive so much of the direct sunlight that very few of them are afflicted by rickets and in the cases of those affected the cause can be usually traced to some other factor.

At one of our greatest universities they experimented with the effect of sunlight on baby chicks as follows: They secured 200 baby chicks, putting 100 of them in one end of a greenhouse where the windows had been washed clean so that the sun could shine in on them, and putting the other 100 in a room exposed to the direct rays of artificial sunlight. This artificial sunlight can be produced in any chemical laboratory. It is merely the regular electric lighting current stepped up to a point where it is strong enough to fuse mercury. You have, no doubt, all seen the blue, mercury lights in factories. That is the ultra-violet ray—artificial sunlight in that the ultra-violet ray is the curative element in real sunlight. At the end of eight weeks the chicks under the artificial sunlight weighed just five times as much as those that had been under the filtered natural sunlight in the greenhouse. When an X-ray picture of those chicks was made it showed the bones of the chicks under the filtered sunlight to be porous, short, knotted and clumsy, while those of the birds exposed to artificial sunlight were long, straight and hard and they stood out very clearly in the picture.

Other experiments have shown that other animals are effected in exactly the same way, those getting the direct sunlight, whether it be natural or artificial, developing in the best possible manner, and those being exposed to the filtered sunlight failing to develop properly.

You have, no doubt, seen dairymen construct fine, large, well-ventilated dairy barns with plenty of window space, indoor drinking fountains, etc., and then shut their herds up in them in the fall and keep them there until spring. Such a herd may be receiving plenty of the right kind of feed, plenty of mineral elements, but they are entirely shut off from the all-powerful sunlight. Such a dairyman, no doubt, thinks he has been treating his herd exceedingly well, so if in the spring they develop Tuberculosis, Contagious Abortion or any of the other dread diseases of cattle, he wonders how such a thing could happen when he has taken such fine care of them. A cow is a very honest manufacturer. No matter what kind or what amount of material she has to work with she always gives a finished product which is as near perfection as possible. Milk contains a very high percentage of mineral matter. Therefore, if she is not receiving plenty of mineral matter with her feed she will rob her body to put this element into her milk. But, even if she is furnished plenty of mineral material and is denied exposure to sunlight which is necessary for the assimilation of such material, she will still be robbing her body to perfect her product. If she has been robbing her body of such essentials all during the winter months her general vitality and resistance to disease will be so reduced that any disease can attack her and quickly gain great headway on account of her condition. So, any dairyman who neglects to maintain the proper environment for assisting mineral digestion and assimilation in his cattle, even though he provide the best dairy barn in the country, is opening the gate to trouble, from the standpoint of Tuberculosis and other diseases.

I have just said a great deal about Vitamine D and minerals and direct sunlight. What is Vitamine D? It is minerals plus sunshine, that's all. Just minerals plus sunlight. Cod liver oil contains the same thing. Those of you who do not care to consume minerals, who are not sun worshippers can sit in the darkness in your basements and drink cod liver oil and you will live to a ripe old age.

In conclusion let me again say that I appreciate very much this opportunity of having been with you today.

Q. What is the effect of treating food with sunlight before feeding?

A. Here is what some authorities will tell you: You can take a large bottle and fill it full of olive oil and take that oil and expose it to the direct rays of the sun for half an hour or an hour and then pour it into a silica bottle with a silica stopper and you have cod liver oil, because you have with it the sunlight.

Q. Does butter fat contain Vitamine D?

A. Butter fat contains some mineral and all you have to do to make it Vitamine D is to expose it to the sunlight.

Q. What is the prospect of being able to make quartz glass in sufficient quantity and at a fair price so that we can light our houses with it?

A. Well, I am informed that there is a gentleman in Maine who has recently invented a form of commercial quartz glass. As soon as quartz glass is produced commercially we will put it on the north, south, east and west sides of our hospitals; we will have it in our homes as well as in our chicken coops and barns.

Q. It won't take the place of minerals in dairy feed, will it?

A. Not alone.

Q. What is a dairy feed that has plenty of mineral in it?

A. Well, I don't think you can make up a feed that will contain sufficient minerals. You have to put it in artificially. You can feed bran, alfalfa and feeds of that character, but a cow that produces 20 to 25 pounds of milk cannot possibly store in her system sufficient material of a mineral character to build her body up and keep from robbing it and making milk too. You have to take some mineral and give it to her. At a western farm they had a cow that gave something like 100 pounds of milk a day for 300 days. She was a big, heavy cow, but her body just seemed to be

giving away and one morning when she tried to get up she broke her hip bone. She died. They opened her up and found that her bones were practically absorbed. She had been such an honest individual that she would not cheat her master, so she used her own skeleton. The feeder did not know enough to give her back something that would maintain her skeleton. After that they started feeding bone meal.

Q. What is your idea about minerals, amounts, etc.?

A. I am not a chemist. I, therefore, refer you to more competent authorities.

Q. In what quantity is it necessary to feed minerals?

A. Oh, it is very light. I suppose a cow should have in addition to her regular ration from a quarter to half a pound of limestone and bone meal a day. It is also a good idea to have some iodine in it.

Q. Would you give that to her in her regular food?

A. Yes.

Q. Now, you are advising more sunlight for the cow?

A. Yes, sir.

Q. Does that mean to keep the cow out in the cold all winter?

A. I think the cow ought to have at least ten minutes of sunshine a day.

Q. Do you recommend inside drinking fountains?

A. Inside fountains are alright—they keep the water right there, but give the cows sunlight, that's all.

If you have any other questions to ask, I shall be glad to try to answer them while I am here. I thank you. [Applause.]

VICE-PRESIDENT MASON: That completes our morning program. We will stand adjourned now until 1:30, this afternoon.

Whereupon the convention adjourned until 1:30 P. M., February 19, 1925.

THURSDAY AFTERNOON SESSION.

February 19, 1925, 1:30 o'Clock P. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: Our afternoon program, ladies and gentlemen, will begin with a solo by Mr. Logan.

Vocal Solo.....Mr. Alex W. Logan

PRESIDENT ALLEN: We have also with us this afternoon Mr. Metzger of the Illinois Agricultural Association, who will make a few remarks.

MR. METZGER: MR. CHAIRMAN AND DELEGATES TO THE ILLINOIS FARMERS' INSTITUTE, LADIES AND GENTLEMEN: I assure you I appreciate this honor of being asked to speak to you for just a few minutes this afternoon. And, I am told that it is a real honor to have the privilege of being sandwiched in for a few minutes on one of these fine programs that has been prepared for this Institute.

I have been here since yesterday morning and I have heard some wonderful talks and discussions. To my mind the discussions up to this point have practically been along one of the main lines in which farmers are interested. You know, I am reminded of a story in respect to this matter of where farmers' interests lie and what their problems are, of a Ford dealer up here in the north end of our state who sometime ago got a questionnaire from Mr. Ford which called for a lot of information, and among other things that this questionnaire wanted to know about was how many Ford-door cars he could sell during a year, how many two-doors he could sell and how many touring cars, roadsters and coupes and so on. Now this energetic dealer sent in all of these questions to the best of his ability, but he didn't get all the information on that questionnaire that he wished to impart to Mr. Ford, so in addition to the questionnaire he wrote a letter and in that letter he said something like this: "Dear Mr. Ford: I have answered your questionnaire to the best of my ability but there is some information which I have which I believe you should have." He said, "It

has been my observation and experience that when I have a four-door they want a two-door, and when I have a two-door they want a four-door and some of them want four doors on the touring car." He says, "My advice to you is that you build up all of your Fords solid, without any doors and that you send a little can opener along with each machine and let them cut out their own doors." [Laughter.]

So I see this matter that is facing the farmer from four angles. I believe that the farmer has four main problems confronting him, and I would like to outline them to you this afternoon and that is about as far as I am going to be able to get in this short period of time. In fact, one of them has been very completely discussed so far on the program and there will be another one or two of them discussed pretty fully before you get through, at least, provision is made, and it is not going to be necessary for me to dwell on them.

PROBLEM OF LEGISLATION.

It appears to me, friends, that one of the big problems confronting the farmers today is a matter of legislation. Now, we have legislation that affects the farmer. We have created and there has been passed legislation during the past two or three years that is of vital importance to the farmer. It may be that we need some more, but the point I am making is that it takes some sort of an organization in order to get across that legislation.

Sometime ago, about Christmas time, I believe, I read an article in the Liberty Magazine. It was written by some man who was supposed to be in very close touch with affairs down at Washington, and he stated that there are at this time at least 165 distinct and organized blocs in the American Congress. Now, if that is true, it appears to me that our government has pretty much ceased to be one of parties, but that it has come to be one of blocs. Let me repeat, if that is true, it is necessary that the farmers maintain a bloc there just the same as any other line of industry or labor. I point that out to you as one of our problems. Remember also that it takes an organization to maintain a bloc. It takes an organization with somebody in control who can scan legislation not only legislation proposed by farmers or for farmers, but other legislation, with the idea of seeing how it is going to affect farmers. Our business has come to be so complex, it has branched out into so many different lines of industry, that you will find a lot of things being done on this side and on that side that has a direct bearing on our economic standing.

We listened to an excellent talk here last evening by a lady who pointed out some of the things with respect to our families and our children. Now, men, I think there isn't anything that we think about more seriously or more often than our families, just what we are going to be able to do with these boys and girls that are coming on and about the training that we give them which will be reflected on society tomorrow and the next day, and I believe that for the most part we were in accord with the things that were given to us to think about here last night.

There are several things necessary in the way of putting most of those things in force. The first is a campaign of education. It is necessary, it seems, that a campaign of education proceed every movement. There was a campaign of education staged for a good many years before our Farm Bureau came into existence, and I am sometimes afraid, as I read over the history of that movement, that a lot of men like you older fellows connected with this Farmers' Institute, who were largely responsible for the movement, will pass away without getting the credit that is due you. So, I say, a campaign of education is the one thing that is necessary to put the thing across.

PROBLEM OF DISTRIBUTION.

But, there is another thing. You will be reminded of some of the points that were raised here last night, particularly those in connection with the schools, that it takes money to do those things. Now, when we buy homes, we want bath rooms, we want bath tubs, we want electric lights, we want electric washers, we want a lot of those things that have been mentioned here, but it takes money, and it has been my observation that the head of

the family, you men who are right here and the rest of the farmers out over this state and the other states, are the fellows who are generally held responsible for the writing of those checks. So, there is the problem that confronts us, and that leads me right up to the second thing that I say is confronting the farmers today, and that is the problem of the distribution of our farm commodities.

Now, that involves a lot of things. It involves transportation, freight rates, water rates, hard roads, the distance to market, the location of those roads and a lot of things that we can't go into in detail and talk about here this afternoon. It involves this thing that we call co-operative marketing. And, friends, I am sometimes afraid that the rank and file of our farmers do not yet comprehend co-operative marketing in its broad sense. I have asked a lot of men this question: What do you understand by "co-operative marketing?" and most of them will say to me "I believe that if we could get an organization that would get for me the profit that this old line elevator gets, that this livestock shipper gets, the buyer of pigs and hogs over there, that I would be pretty well satisfied." Now, friends, you would not. You would not. You are getting the most of that now. Six hundred farmers' elevators in Illinois, handling 65 per cent of the farmers' grain are compelling the other fellows who are left to bid mighty close to the market. We are getting the most of that, and yet you are not generally satisfied with the price of grain, are you? 529 livestock shipping associations in Illinois are compelling the old line livestock buyers that are left to bid pretty close to the market, and yet generally speaking you are not satisfied with the prices of livestock, are you? That is true on down the line. I think I am safe in making this assertion, that if you were to get all of the margin that these local dealers get in this community and all over our state, that you still would not be satisfied with the prices for your livestock, your grain and these other products.

In other words, the conception of co-operative marketing that our leading farmers are coming to get is this: that it must be some sort of a co-operative marketing venture, established along commodity lines, that will be large enough and strong enough that they can be a real factor in the market and go at least to some distance toward raising this general price level. Now, what does that mean? As I take it, it means just this: that we must have a co-operative marketing organization strong enough, with a wide enough scope so that it can deal with this thing we call surplus. Our President discussed that last night from two or three different angles. He made this point, and very clearly and correctly, I think, that the surplus we have of these various commodities in a given year really do not amount to very much in the aggregate, yet it effects price.

I listened to Ex-Governor Lowden a short time ago, and in some of the remarks he made in a speech he pointed out this fact that last summer there was a cargo of butter came into New York, and there was enough butter in that cargo to spread the bread on the breakfast tables of New York that morning. All that information went out over the wires and over the radios to these big dairy producing centers, the centers of milk condensation, creameries, and so forth, and it broke the price from three to five cents a pound. Now, how would a co-operative organization function there? A co-operative organization with control of that surplus, or a little more, would have done exactly like big business does these days. It would have held back its butter and allowed those New Yorkers to spread that butter on their bread that morning, and then come back and sell them butter for dinner at the same price.

Now, I believe if we can get a co-operative marketing organization of that kind which will base their sales on standard quality, an organization that has control of surplus and a little more so it will allow the economic law of supply and demand to operate unmolested, then you are going to get a price for your grain, your livestock and your other farm commodities which will be satisfactory. Now, that thing is a big, long lecture in itself and I can't dwell on it very long.

Another large problem is the matter of taxation. Our taxes have been increasing at a wonderful rate of speed, and they have gotten to the point

where they are getting to be a real burden. The Illinois Agricultural Association has been making some study along that line. I was particularly interested in what our last speaker had to say on the program last night concerning the valuation of property in the city of Chicago and County of Cook. You will remember that he pointed out to you that the good, black land of Illinois was going to be worth $1,000 an acre some day. He didn't say how long that would be but he said it would be in the lifetime of a lot of us here. He said that property within one-half mile of the place where he lived is selling at $2,500 a front foot, and he commented on the high taxes they paid, and I then recognized that it was a problem in the city as well as it is here.

But, my friends, if you would go into the office of our statistician and get some of the real information of the values that are assessed for taxation purposes on some of that land that is selling at $2,000 a front foot and then take it out here and compare it with the values on some of your land that you would be glad to get $250 an acre for, you will find there is a real problem existing insofar as equalization is concerned. Now, there has been a lot of work done along that line in Illinois, and it has been pretty largely due to the effect of farm organizations that during the past three years there has been a saving made in the tax on farm land aggregating $4,000,000; about $2,250,000 of that amount was made during the past year, or from 1923 to 1925, and that has been due to a matter of equalization. The tax problem is a lecture in itself. A lot of other interesting information has been gathered there, but my point is this, that it takes an organization with trained men who can gather that information and assemble it so that it will be of some value.

EFFICIENCY IN PRODUCTION.

Now, the last thing I don't want to discuss at all; that is the thing you have been talking about here yesterday and today, and that is, efficiency in production. Men, that is a thing we are going to get away from. Your Farmers' Institute has been advocating it for a long number of years, but we are just getting to the point where we are beginning to cash in on a lot of those things. Mr. Johnstone, for instance, told you of the McLean system of hog sanitation, how he had increased the general average of the number of hogs that he was getting from his sows. I also listened to Prof. Caldwell this morning talking about economy and production with respect to dairy cattle. Our friend from Iowa this afternoon will tell you some more things that has a direct bearing on efficiency and production. That is one of the biggest problems.

I just want to make this comment in conclusion: we pick up the trade journals of one kind or another, from week to week and month to month, and we see an incredible number of business concerns that are going to the wall. If we had a trade journal that would represent agriculture in the same way that those magazines represent other business, you would find a like number of farmers who are going to the wall, and I think you are going to find a lot of them go to the wall this spring. This is just five years from the high point of land values in the speculation which we experienced in this state and the other part of the country, and a lot of those notes are coming due this spring, and a lot of farmers are going to step out of business. In other words, my friends, the farmer who continues to operate his farm along the same old business lines, disregarding the good things that have come about through these farmers' institutes and through these farm bureau organizations, failing to take advantage, of one thing, for example, that is happening right here in the Edgar County Farm Bureau, namely, the testing out of diseased corn and a lot of other advanced ideas like that, is sooner or later going to be eliminated by the general process of economic depression; he will go out of business.

Now, those four things I have viewed as the real problem confronting the farmers. This institute and others dwell pretty largely upon the idea of economy and production, and I believe that is one of our biggest problems, but let us not overlook the fact that we have other problems: the first is

legislation; second, the matter of the distribution of our farm commodities; third, taxation; fourth, efficiency in production. I thank you. [Applause.]

PRESIDENT ALLEN: I now have pleasure in introducing to you this afternoon a representative from the United States Department of Agriculture, Dr. Tenny, who will speak to us on the subject of "Farm Marketing."

SOME SOLUTIONS FOR OUR MARKETING PROBLEMS.

DR. LLOYD S. TENNY: LADIES AND GENTLEMEN: We have been living in a period of the world's history during which probably more changes have taken place than during any other fifty years of the world's history, and the question that I want to put before you and through you before all the farmers throughout the country is, are we recognizing these changes? Do we appreciate the fact that we live in a different economic age today than existed fifty or sixty years ago, agriculturally speaking? And are we adjusting our farm operations, our farm planting, our farm marketing to these new conditions? I maintain that in the main we are not.

One hundred years ago, before the Erie Canal was built, my grandfather went out into Western Now York and took up a little farm, eighteen miles from Rochester, which we own today. He cleared off the hardwood timber and planted various farm crops. Field after field was planted to wheat, because that was in the great Genesee Valley, which at that time was the wheat belt of the country. The first wheat was harvested in midsummer, and he loaded up the old farm wagon and hitched to it the team of horses and early in the morning got aboard the lumber wagon and drove the eighteen miles and delivered that wheat to the mills there at the Genesee Falls. A little later in the fall as his orchards came into bearing he picked his peaches, hitched up the same old team of horses, perhaps took a lighter wagon, and drove to the same city and sold those peaches to the housewives of Rochester. So, throughout the summer and fall, week in and week out, he was taking the results of his farm labor and distributing those farm products direct to the consumers in Rochester.

Do you think for a moment that my grandfather gave very much conscious thought to marketing questions? Do you think that he gave very much conscious thought to the question of what he was going to produce and how much of the different products he was going to produce? I don't think he gave much conscious thought to it at all. His decision was almost instantaneous, because he knew that he couldn't sell certain varieties of wheat to the millers in Rochester and he didn't produce those varieties. He knew that he couldn't sell a white peach to the housewives of Rochester so he didn't produce white-flesh peaches. He knew that he could sell Baldwin apples and other bright red apples, and he knew that he could sell bright, fine, yellow peaches. He knew that he could sell certain varieties of pears. The whole process was readily adjusted because my grandfather, as a farmer, was face to face with the consumers of his products.

The same farm exists. For fifty-six years my father farmed there and we are farming there today. But what a change has taken place. Today we don't raise very much wheat. The question of what the Rochester miller wants would be practically negligible in our farm operation. The question of our peaches is not a question of what the housewife of Rochester wants; it is a question of what the housewife in Baltimore or Washington or Philadelphia or Cleveland or even Chicago wants. The question of the wheat or the red apple is a question that may be answered in Atlanta or New Orleans. In other words, in the course of the lifetime practically of one man, my father, agriculture has greatly changed.

AGRICULTURAL PRODUCTION A WORLD PROBLEM.

Many of us have not awakened to the fact that we have been going along in our farm manufacturing processes thinking only of our forty or eighty acres, of what our fathers produced on this farm, what is the easiest under our present conditions to manufacture on that farm without giving sufficient thought to the question of where the product is going, who is going to buy it and what they want from our farm.

If your farmer and your consumer are going to be five hundred to three thousand miles apart from each other, then you have got a number of rather serious problems to understand if you are going to have satisfactory agriculture. The farmer is not manufacturing for his own benefit or to suit his own wishes. Whether he knows it or not, he is manufacturing for the wishes and whims of the consumer that is a long way off. That is a hard lesson for some of us to learn. As a farmer, we are a manufacturing concern, pure and simple. Take a concrete example out of the field of industry: It is easy for us to see that the maker of a Gillette razor or the maker of a Ford car or the maker of any other standardized product spends no time thinking what he wants to do or what his laborers want to do; he manufactures in the light of what he can sell, and he can sell what the consumer wants.

Now if we could farm our eighty acres as if it were only a part of one great scheme or plan embracing all other farms we would be in a fair way to solve our great marketing problems. As a matter of fact we can come nearer doing this, today, than most of us realize. I maintain that in this great field of agriculture, in spite of our great experimental stations, our great colleges and our great Department of Agriculture at Washington, in a general way we have gone on to a surprising extent with blind production.

I am convinced that the solution of our agricultural problem must start from an economic basis. We have got to take into consideration not only what we are producing but what all the other people in this country are producing. We can't stop there, we have got to consider production throughout the whole world, for the question of what is going to happen in southern Russia, for instance, is of vital importance to the producer of wheat in this country.

In other words, agriculture has been developed into a world industry. With our modern railroads and other means of transportation, whereby it is possible to move agricultural products from one part of the country to the other in a few days, from one side of the globe to the other in a few weeks, and where our housewives are depending upon the uttermost ends of the earth for the commodities they are buying today or any day of the year—with these conditions existing agriculture has become a world problem, and unless we attempt to solve it in the light of world conditions we are not going to solve it satisfactorily.

Coming up from the hotel just now I passed a grocery store in whose two big, front windows there was not a product that is grown within five hundred miles of Paris, Illinois. Oranges and peaches from California; grape fruit from Florida; lettuce again from California; canned goods from New Jersey and other points, and so on down the line.

For a number of years prior to the world war, the Department of Agriculture was interested in a marconi type of wheat. It didn't make much headway in this country. Then the world war came, and almost instantaneously the situation in regard to the marconi type of wheat was changed. In the place of other varieties, literally hundreds of thousands of acres of this type of wheat sprang up in the northwest part of our country. Why? Because the wheat fields of southern Russia were kept off the market through a world war.

Our farmers would prefer to grow that kind of wheat. They can produce it cheaper and in larger quantities and they are going to continue to produce it until—when? Until the Caspian and the Mediterranean Seas are again teeming with vessels carrying wheat from southern Russia. When that happens our marconi industry is gone, and yet I suppose it would be safe to say that a great many of our farmers are producing that type of wheat without any particular thought of that. They are not looking into the future or trying to solve their production and marketing problems in the light of world conditions. Our agricultural problem is a world problem, and we can't solve it unless we take a world's viewpoint.

The United States was rather startled some three years ago when Dr. H. C. Taylor publicly stated that eighty per cent of the marketing problem could be solved in production. I think he was not very far out of line. Eighty per

cent of your marketing problem can be solved by the right kind of production.

NO "CURE ALL" POSSIBLE.

What are the solutions to this complex situation? There is nothing that will cure it all, not even cooperative marketing. For a number of years I was in charge of the cooperative marketing work of the Department of Agriculture, and in spite of the comprehensive knowledge of American cooperative marketing that that gave me still I say that cooperative marketing in itself is not a panacea for all of our ills in marketing.

The solution is going to come, if it comes at all, in a combination of many comparatively small things. In the first place, the consumer is a peculiar animal. She or he wants something when she wants it and she wants it the way she wants it. The farmer has got to take that into consideration. In preparing products for the consumer we must go a long way farther than we have yet gone in standardizing our agricultural products for marketing. Baltimore is one of our best markets for fruit from western New York. Recently I couldn't find a wholesaler or retailer in the Baltimore market who could tell me how to buy a carload of western New York Baldwins with the assurance that I would get a carload that was just like a certain barrel in his store. They said: I can't tell you how to do it; they are not there by the carload; you have got to go up there and pick them out." That is a great accusation against western New York. It means that western New York is not putting a standardized pack of apples on the market, and what is true of western New York is true of most of agriculture all the way from Maine to California with a few exceptions.

Probably no commodity is sold cheaper than Ford cars. The margin between the price FOB Detroit and the price that you and I pay as we buy our Ford cars has been squeezed down perhaps to the limit of possibility. Why? How much time did you take, how long did anybody take, when you bought your last Ford car? Not very much. Why? Because you had a clear concept of a Ford car. You knew just as well what it would be like as you would have if you had spent a week looking it over or had ten salesmen come and explain it to you. It didn't make a bit of difference whether you were buying that car in Washington or in Paris, Illinois, or in Paris, France. All of us have a clear concept of the Ford car, and the cost of selling it to us has been reduced to the minimum.

It is not possible to standardize agricultural products to the same point that commercial products can be standardized, but we can go leagues farther than we have yet gone in standardizing our agricultural products and putting them onto the market in quantity. Quantity marketing of standardized products will go a long way in reducing the cost of marketing and in solving our marketing problems. So, first of all, we need better standardized agricultural products to sell.

HOW THE GOVERNMENT CAN HELP.

As a means to that end, the Department of Agriculture has been enabled, through generous appropriation and legislation by Congress, to assist the farm people in standardizing their products through an inspection service. Some six years ago Congress first gave us authority to inspect cars of produce moving from all over the country to terminal markets. About two years ago the law was amended, making it possible for us to inspect these products at the point of shipment. Today we are inspecting nearly 200,000 cars of perishable farm products, right in front of the farmer—at his packing houses, at his shipping station, and occasionally at his farm. We are showing him through that inspection service what can't go to market, and what should go to the market. We are giving him a certificate as to quality and condition on his carload of produce that is given great weight by the courts, by the shippers, by the carriers, and by the dealers. We have not yet got back to all the farms. We have 6,000,000 individual producing communities in these United States. Not until we have carried this educational work back to the men on these 6,000,000 farms, not only in theory but in practice, are we going to have standardization work carried at a point where it will make our marketing as a whole materially more successful.

The second great service performed is our market news work. A number of years ago I was in Florida on a little jerk-water railroad that ran across the State, stopping at every cross-road. The orange packing season was going fullblast. There were only three or four of us in the day coach, and one was a man from a produce house in Philadelphia. He had a telegram that he was taking to about twelve packing houses along this railroad. Our train stopped at these various packing houses, and usually had much switching to do, so there was plenty of time for us to go in and see the manager. In each case this man showed the manager the telegram, which in substance gave the market conditions in Philadelphia for oranges. Everything was rosy according to that telegram, and all that these managers needed to do to make money was to ship oranges to this house. This man got a dozen cars sent to that house that day. In those twelve packing houses there was absolutely no source of unbiased and correct information on prices. Only this one telegram from one firm that wanted their business.

Today if you go into Florida you will find at Orlando, Sanford, Tampa, Jacksonville and from those places scattered throughout all the State, every day at one o'clock, a compilation that has come from our Washington Office. The information in this compilation has come over a leased wire from Chicago, from St. Louis, from New York, from Boston, from Philadelphia, into our Washington Office. The information includes the number of cars of citrous fruits loaded, unloaded, number of cars left on track last night, the prices for yesterday, opening prices on oranges and grape fruit today, weather conditions and every other bit of interest that is essential and fundamental to the making of a price on that product today in all of these cities. That information is now available each day in every packing house in Florida. That same information is available for every farmer in the United States for any commodity he is interested in.

Today you have only to listen in on a radio set, you have only to get in touch with your State institution, or with the Federal Department of Agriculture, and you will find that we are flooding this whole country with market information that is of value to you men on your farm, in your daily farm operations, if you will use it.

There is a new phase of work that I believe is going to be revolutionary in its effect on agriculture in years to come. We are criticized in some quarters now for this work, but you can't do anything really worth while without criticism, and the work continues to go forward. The two ideas back of this work were conceived in the mind of Henry Wallace, a great Secretary of Agriculture; a Secretary of Agriculture who was thoroughly trained in the economic side of agriculture. Secretary Wallace was not only thoroughly grounded in economic production, but he saw much farther than the majority of us see into the question of economic distribution in agriculture.

This new work consists in getting out a yearly Agricultural Outlook Report and a report on farmers' intentions to plant. We have been at this only for a year and a half, so the work is quite new. Twice a year we get together all the brains we can muster in the Bureau of Agricultural Economics and in the Department of Agriculture, and we concentrate them on analyzing the present situation and the outlook for the year.

THE CONSUMING SIDE IMPORTANT.

You may ask what this will do. First of all we take into consideration the consuming side. Detroit, with its automobile business, New Hartford with its cotton business, the great South with its great manufacturing industries, the great industrial city of Chicago—all those cities are the barometers of demand. In a very large measure they determine what the price of our agricultural products is going to be, because the law of supply and demand works in both directions. After all, the basic thing is the question of what the people are willing to buy, how much they are willing to pay, how much they can afford to pay. Therefore demand for agricultural products depends, to a very large extent, upon the industrial conditions throughout the country.

So we take all the reports from the commercial organizations and from

the banks and we try to analyze what the industrial condition is going to be for the next six months. We don't say what it is going to be, but we try to place before the public all the facts that will help to arrive at the right conclusion as to what is going to happen in the industrial field. We also try to determine the number of carryovers and the supplies on hand of these different agricultural products to see how far they will go toward meeting the probable demand. And we are getting so close to predicting how many hogs are going into the Chicago market, for instance, a year from now that it is almost uncanny.

We bring all that information together for the farmer. We show the situation with regard to corn, for instance; hold-over corn, price of corn and every other factor relating to corn; we show the number of hogs that have moved to market, the number left on farms. We put all that information together so that you can read not only the lines, but a little between the lines, and can come very near determining what your farm operations for the next six months in regard to corn and hogs ought to be, and what your farm operations for the next six months in regard to planting wheat ought to be.

The next step of this work is to get the intentions of farmers in regard to each commodity. For instance, right now we are sending out to all spring wheat territory a questionnaire asking some very simple questions: "On your own farm, Mr. Farmer, how many acres of spring wheat are you planning to plant in 1925?" Those are simply questions and the farmers know what their intentions are. These questionnaires will be back in the Department of Agriculture before he plants an acre of spring wheat. If the total of these intentions is out of line with the needs as shown in the Outlook Report, a warning is issued.

A man wrote in to us and said: "You pointed out in the Intentions to Plant that farmers were going to do this and that with regard to flax, and they didn't do it at all." That was just the result we wanted. We can't control their intentions, but we can aid them to alter their intentions to fit conditions and demand. Unless their intentions exactly fit in with the outlook report the wise ones are going to change their plans and the results will be different from the first intentions.

In this way we are helping the farmer to solve his marketing problems through properly adjusting his production. In twenty-five years, probably in ten years, people will wonder how in the world we ever got along without this knowledge of the prospects for demand and the prospects in regard to meeting this demand.

The Department of Agriculture is often criticized for sending a man to the Danube Basin, for sending a man to South America, for sending a man to China—all in the interest of American agriculture. But I say to you that you are more interested in what is taking place in Brazil and Argentina in the cattle industry than you are in a hundred and one things that are not two miles away from your farm. Things that take place on the cattle ranges of Argentina are going to affect your profits and your losses more than a hundred things that are nearer by.

The world is big, but it is comparatively small today when it comes to a question of competition. We have got to recognize that the sheep industry of New Zealand and Australia, the wheat and the livestock of the Argentine, the peanuts and other nuts from China, the wheat fields of the Danube Basin, the several interests of England, Germany, Italy and Japan, are all elbow to elbow with you on your 160 acres of land. The success of your 160 acres is going to be determined largely by how much you, as master of that farm, look at world conditions.

Our next big problem is to put on an extensive educational drive which is going to carry the essence of our vast fund of information and statistics and knowledge of all our other work and how to make use of results back to you, and through the county agents and other agencies to make it part and parcel of your farm operations.

PRESIDENT ALLEN: Our next speaker, whom you no doubt all know, will speak on the subject of "Profitable Cattle Feeding Pointers", and I take pleasure in introducing to you Prof. John Evvard of the Iowa State College.

PROFITABLE CATTLE FEEDING POINTERS.*

(By John M. Evvard.)

Fellow Suckers and Others: It is glorious to come again and greet fellow suckers and all others. There is a real satisfaction in coming back to the old stamping ground in which I got my start, to the soil from which I sprang. Somehow or other, when the invitation was again extended to me to return to my native state, the state that has nourished and kept my father and mother and sisters during all these years, I had to come; that's all.

John M. Evvard.

I feel toward Illinois as the state that I cannot help but love, and for which I would do almost anything out of devotion for a good cause, such as would help the people of this state to fare better in the way of living happier, more successful, and more prosperous lives. So, I am here with you again today, this time to talk on the topic of cattle rather than swine feeding.

I have a great deal of "stuff" here (pointing to manuscripts, charts, tables, etc.,) too much for today, but what I cannot cover in the hour at my disposal will appear, I take it, in the Twentieth Annual Report which will follow on the heels of the Nineteenth, the one that has just come from the press.

Mr. Tenny, your previous speaker, has emphasized four cardinal points on the farm program: legislation, transportation, taxation and production. There are other points, of course, but those are some of the cardinal ones, and I would not for a moment emphasize unduly the production aspects, even though our production problems are with us always.

Other things being equal, regardless of what the marketing situation is, regardless of what the taxes are, regardless of what the legislation is, he who produces best and cheapest, and who hits the right market with the right kind of product is the one who, other things being equal, profits most. Like the poor, production problems are with us always; the whole field of production is a basic one. We cannot have transportation, or taxation (very long) or even legislation (which costs money) unless we have a profitable production. But everything is relative in this world.

WE LIVE NOW IN A NEW AGE.

In the old days of Martin Luther the people believed that everything centered around the earth, and that this great universe revolved and had its destiny in a central point,—this old mother earth of ours to go around which takes plenty enough of gas, and tires, and sails, etc., etc., for the 25,000 miles, but Copernicus said, and found it to be true, that we (the earth and all attached thereto) were revolving around the sun which was 93,000,000 miles away, and that it took a year to get around, and that we were but one of the satellites, and that there were thousands and thousands of such satellites in the universe. That doctrine was so obnoxious at that time that Martin Luther, who himself marked an epoch in world's history, branded Copernicus as an "upstart of an astrologist". But Copernicus was right.

Today when we were talking at the table I said it was fortunate, perhaps, that Dr. Cyril G. Hopkins of your own University lived when he did, because if he had lived in France in 1790, he might have suffered the same fate as Lavisier, that great and eminent French chemist, who was guillotined because he dared to differ from the populace. He was thrust in-

* "Revised and Enlarged October, 1925. The Experimental work of 1917-18; 1918-19; and 1924-25 reported herein was done jointly by the author and associates in the various years as follows: 1917-18, W. H. Pew, and Russell Dunn; 1918-19, W. H. Savin and H. D. Van Matre; and 1924-25, C. C. Culbertson, W. E. Hammond and Q. W. Wallace. The Experimental feeders in 1917-18 were E. J. Strausbaugh and M. D. Farnsworth, and the latter in the other two years."

to prison, and finally his head paid the penalty on the guillotine. Official France gave the answer to this diabolical deed when she said "France has no need for chemists.

Socrates, because he dared to promulgate a doctrine that was true, but which folks were intolerant of, was condemned,—and then compelled to drink the poison hemlock.

History is replete with the stories of individuals who were burned at the stake because they had "minds of their own". But from their pyres the spirit of tolerance for the truth has been wafted, and so because of their martyrdom we are a better people.

Do you realize that it is only about two hundred years ago since they burned witches at the stake in England? Witch burning in the old days was a very happy diversion on the part of the populace. It is surprising how a supposedly enlightened people resorted to such a diabolical practice. Even in 1660 the majority of educated men, according to Buckle, still believed in witchcraft; while in 1688 the majority disbelieved in it. It is said by Dr. Parr that two witches were hung in Northampton as late as 1705, and that in 1712 five other witches suffered the same fate at the same place. Buckle tells us in his history entitled "Civilization in England" that Wesley, who had more influence than all the Bishops put together, made the flat statement that the giving up of witchcraft was in effect giving up the bible, and to this Wesley also added that he could not give it up, this existence of witchcraft, until he gave up all the credit of all history, sacred and profane. Nevertheless, year by year witchcraft diminished.

In 1736, even before Wesley made these statements, the laws against witchcraft were repealed and so Buckle tells us there was another vestige of superstition effaced from the English statute book." I simply mention these things to point out that in the old days it was dangerous to say something new, it was even dangerous to say some true things that the majority of the folks believed in. Even today one is likely to lose a certain kind of caste if he becomes "unorthodox," or should I say heterodox, in his views even though he has sufficient proof to back up his contention.

But the days of witchcraft have gone, this being true in spite of the fact that they are plenty of people living today who would like to burn certain folks at the stake. I have been told that there are certain ones in this world, people representing certain feed manufacturing interests, who are selling certain types of feed to the farmer that I don't think are generally worth the money, not by a long ways, would like to see me given a dressing, something like the witches of old got. Nevertheless, in spite of certain exceptions to the widely accepted rule we are today enjoying a new era, an era of academic freedom, and he who knows the truth and speaks it, and has the evidence to back it up will in the long run win out if he sticks to the game.

In this new day we have developed in the great processes of evolution new experimental methods, new facts, new theories, and new visions. Some of these were illustrated for you here today by your honored guest, Dr. Tenny, of the United States Department of Agriculture.

A GREAT SECRETARY OF AGRICULTURE.

It did me good to hear Dr. Tenny say that Henry C. Wallace was a wonderful Secretary of Agriculture, because he was, and because I'm an Iowan who "loved" Henry C. Wallace. It was the privilege and pleasure of some of us to have often had the opportunity of living close to this man; it was the pleasure of some of us to have spent many a night in his fine hospitable home, and to have rubbed shoulder to shoulder with him on many bristling occasions. He was an exceedingly liberal man, a man with broad vision, a man of extreme tolerance, a man, a real man among men. When Agriculture lost Henry C. Wallace she lost one of her greatest sons. So, today all we can do, in a sense, is to realize that he is gone, but yet we must be careful lest we mourn because he would not have it so. He would not have us grieve that he has left, but he would have us go on, and on, battling, yea fighting if it be necessary, for a greater and better agriculture, a self sustaining agriculture.

WELL BOUGHT AT THE START IS TWO-THIRDS OF THE JOB OF SELLING ADVANTAGEOUSLY AT THE FINISH.

The most successful cattle feeders are good buyers, and they are good buyers because they are well posted on cattle values; good judges of the "sellers" weaknesses; good "estimaters" of the steers or other cattle outcome; good "waiters" or speeders for closing the sales, as the dickering may warrant; and superb *traders*.

Of course, such men know how to feed, what to feed and how, when, and where to market so as to hit well above the average price for the kind sold. Yes, such a fellow is "some feller."

"PLENTY" OF GOOD WHOLESOME DRINKING WATER PAYS DIVIDENDS REGULARLY.

The ideal is to keep good clean fresh water before the steers at all times—but, of course, when the tank heater is not used the troughs may freeze over at night, particularly in the very cold "below zero" days, in which cases the ice is broken open in the morning and the water made available throughout the day. The fact that the steers in two of the lots in the winter experiment of 1924-25 made 103 pounds of gain a month, and better, indicates that this method of watering is "pretty good."

This steer received shelled corn, hand full-fed; linseed oil-meal 3 pounds per head daily, in two feeds on the silage; alfalfa hay, limited to about a pound per head daily; and block salt self-fed.

This particular steer and his lot "colleagues" gained better than 97 pounds per month in the four months winter feeding period, they injesting, per head daily, approximately three score pounds, or 60 pounds of water, in their feed and from the trough, better than 3½ tons of water in a 4 months feeding period. The average steer fed as this one, takes in four months, some six times his weight in water; that's some hydraulic performance.

Keep the water open; that's what counts.

And say, the water trough should be handy, and easily accessible,—not in a mud hole for best returns.

There has come from the press a new book entitled "Our Debt and Duty to the Farmer" by Henry C. Wallace. This is a wonderful book, the spiritual interior of which is pretty well exemplified by a quotation from Theodore Roosevelt which appears just following the foreword. This quotation is: "I warn my countrymen that the great recent progress made in city life is not a full measure of our civilization; for our civilization rests at bottom on the wholesomeness, the attractiveness, and the completeness, as well as the prosperity, of life in the country. . . . If there is one lesson taught by history it is that the permanent greatness of any state must ultimately depend more upon the character of its country population than upon anything else. No growth of cities, no growth of wealth can make up for a loss in either the number or the character of the farming population."

Henry C. Wallace and Theodore Roosevelt thought alike on a great many subjects, and particularly did they think alike in a great many respects as regards the future of the agriculture of these United States of America. It is worth the while of every one of you to get this new book from the Century Company, and read it; you will never regret it, and you will catch from it a vision that is worth while.

Secretary Wallace certainly had a big job when he entered the cabinet at the time when he did. It is too bad that so good a man had to be taken from us just at a time when he was in the Hey Day of closing up a wonderful four years of administration.

THE CATTLE FEEDING BUSINESS.

Today, I want to present to you some practical worth-while results which we have secured experimentally at the Iowa Agricultural Experiment Station. Of course, it is unnecessary for me to tell you that it is an easy matter to make mistakes in the cattle feeding business, mistakes as regards the collection and selection of steers, mistakes as regards the type and predicted outcome of these steers, mistakes as regards the feeds which are purchased to balance or go with our home grown feeds, mistakes which are made in the management of the steers, mistakes made in the shipping of the cattle, and mistakes made in the marketing of the bovines.

We may also add here that many of us have made mistakes, likewise, with the money which we have secured after the steers were marketed. But those are bygones; and we are looking to the future now.

But before getting down to brass tacks on this cattle feeding business, down to a discussion of cattle feeding problems, it behooves me to tell a story which is illustrative of some of the material which I am going to give; so here goes the story.

Perhaps it will be best to tell you that this is an enlightening story because it pertains to Israelites, few of whom by the way, are cattle feeders. They have a more sure game.

Ikey and Jakie are the heroes who are in business. They had a customer who owed them a large bill and Ikey said to Jakie, "Vell, ve must do somding; ve need the money and ve must have it in our busness." Ikey paused, lifted his palms upward in a characteristic way and said, "Vill you write him a letter?" And Jakie replies, "Yes, I vill write him a gude letter." So he wrote a letter to the customer and came back and showed it to Ikey, and Ikey looked the letter over, then paused, looked over his rimmed spectacles and said, "Vell, Jakie, that vill get the money all right, Yah! but it vill make the customer awful mad; it vill make him turrible mad, yah! He hesitated and then continued "You'd better write another letter to dot man."

So Jakie disappeared and after a few hours came back again with another letter, and he says, "Ikey, here ist another letter." Ikey took the letter, and while reading it over carefully, a big smile sprang up all over his face, and shrugging his shoulders he said, "Jakie, dot vill get the money all right, all right", and holding his breath a moment he continued, "it won't make the customer mad either, it vill not." Then he hesitated

some more, shook his forefinger appallingly at Jakie and remonstrated, "But now, Jakie, you must be much more careful hereafter mit your spellin'. You vill see here dot you spelled "lousy" with a "z" and "devil" with two "ll's".

BIG PROBLEMS IN CATTLE FEEDING.

Now, in cattle feeding we have a good many problems, some louzy ones and some "devillish" ones. We want to get the money, and we don't want to make the other fellow, the one we get the cattle from, mad. We want to so manipulate our operations that we will have returned into the coffers of the farm exchequer the maximum of profits; so, if I spell "lousy" with a "z" and "devil" with two "ll's", in telling you of our experiments, it is with devotion to economical beef making duty, with devotion to your interests. Please know that I am doing all this in the good cause, and that I hope Ikey was right, that I will not make the now-a-day customer for timothy hay, mixed hay, etc., or for molasses, screenings, peat, and combinations of such products, mad.

Before discussing the feeding proposition there are some factors about cattle feeding, some particular phases that you will now be interested in I am sure, we will digress for a moment from the feeding material which I have here to present to you and take up some of the economical factors, other than feeding, which have to do with profitable beef production. In this paper I am emphasizing the problems of the man who feeds cattle rather than the man who grows them, or who grows them and "feeds them on" until they reach the finished condition ready for market.

KEEPING UP-TO-DATE.

Dr. Tenny has emphasized that it is wise that we keep moving, keep up-to-date in this great melo-drama of existence, and that we be very careful to change our methods to meet new conditions. We who have followed our fathers, our good old dads, in this cattle feeding business must be particularly careful to do full honor to these dads, and not follow, duplicating meanwhile, in their footsteps; by that I mean that we had best be wise and not do things just exactly like Dad did then, because I am sure that your Dad and mine would not have us do things that way, this simply because he would know better, do them differently himself if he were here under the new conditions.

In the last 50 years there have been marked changes occur in the cattle feeding industry. The problems of 50 years ago are no longer the problems of today, but the problems of today are equally as stupendous, and equally as hard to solve as the problems of a half century since.

CYCLES IN CATTLE PROFITS.

In the cattle breeding business the profit periods come about 14 years apart; in other words it takes about 14 years for the business to get good counting from the middle of the period when it was good previously; this means therefore that on the average for the man who breeds his cattle,—raises them, and feeds them through—that there are about seven years of a downward tendency, and likewise seven years of an upward tendency on the average. At the bottom of the seven year downward stress we are going into a period of depression, whereas at the top of the seven years of an upward pull we are in a period of what some would call inflation, or better said,—the period or point of high profit.

On the other hand, let us turn to a consideration of the cattle finishing operation. We note the shorter swing between profit or between loss periods in that particular business. Steer feeding swings are short; in other words we go from a profit area to a loss period in a brief span of time. A careful study of the years of profit in steer fattening or finishing shows that the interval between profit years, or said another way between loss years, is rather short, varying from one to four years.

Beginning in 1907 and continuing up to the year 1922 my figures show that steers fed in the Corn Belt within a market range of Chicago showed profit in eight of these years and losses in eight other years. It can be

seen therefore that this was a tit for tat's business or you might say a tat for tit's business, a year of profit and a year of loss on the average. Of course the intervals from profits to losses, or vice versa, were not so regular as this sounds.

Sometimes we may experience as many as four years in succession which will show more profits than losses as for instance from 1900 to 1913. One loss period continued practically for three years, or from 1919 to 1921 inclusive. It appears that if one has an experience of a couple of continuous loss years, better still three, that the chances for a profit in the year ahead are much the greater than if he has experienced a couple good years.

As a whole it appears that cattle feeding profits are somewhat uncertain, and that the changes from profits to losses or vice versa may occur in a very short interval of time.

In the hog business our profit years and our loss years follow each other with considerable regularity, but in the steer feeding business the profit periods are much more uncertain. These periods are not only uncertain but they are very irregular and therefore not nearly so predictable as are the profit periods in swine production.

One of the best ways to take advantage in the cattle feeding business so as to get the most out of it, and be certain about it, is to stay with it year after year, placing more dependence upon the manure which is secured from these cattle than the actual dollars secured from the sales end. On our Indiana, Illinois, Iowa and other Corn Belt state farms we are in need of manure, the kind of manure that comes from the cattle feeding lots. It is the manure that supplies the indirect profits in cattle feeding, and it is the manure that we must depend upon, and give credit to, if we are to make the most out of the cattle feeding business.

Inasmuch as the cattle feeding business is one that can be gotten into and out of rather quickly, one naturally expects just the sort of hazardous and uncertain results as the industry shows. On the other hand when we get to examining the proposition from the "success" standpoint we find that the shrewd operator, the good buyer, the good feeder and the good seller, can make more hits than misses; whereas the average fellow who just jumps in and out with a careful analysis of the various controlling factors is likely to hit it only about as many times as he misses it, or vice versa.

COSTS IN STEER FATTENING.

We have prepared for you a typical distribution of the costs in steer fattening, the figures being based on the single average steer basis. Table I which we present points out just what enters from the feeders' standpoint into the cost of the finished steer. What are the various factors which must be considered?

This Table I was made up after studying 134 droves of cattle comprising 5,534 head in Iowa a few days ago. These cattle weighed on the average 841 pounds when the feeding period started. The average feeding period was 194 days during which time the cattle made an average daily gain of 1.83 pounds or a total of 353 pounds between the initial weight in the feed lot and the market selling weight. We have considered the data on the basis of "feedlot to market time", the total gain being made from the actual weight in the feed lot as compared to the final selling weight at the terminal market.

At the time this data was collected, corn was selling on the average for about 52 cents per bushel on the farm, shelled basis. At this price it is charged to the cattle. The debits and the credits with the finished steers' cost distribution as well as the net cost per steer, as averaged on these 134 droves, are all to be found in Table I.

This Table I is in large measure self-explanatory. It shows clearly that in this particular study that 61 per cent of the total net costs of the feeding operation was in the initial cost of the feeder steer laid down on the farm, practically 30 per cent of the cost was feed cost, whereas only 3 per cent ran to labor and 1 per cent to buildings and equipment. The risk was very small, only one-half of one per cent, and the veterinary and insurance fees together with the taxes and incidentals amounted to less than 1 per cent.

The interest charge, however, ran close to 4 per cent as the marketing expense was even a little larger than the interest cost.

We have to offset these above costs however, the manure return which amounted to close to 2 per cent and the hog pick-up which was a little better than 2 per cent.

It is certainly good business to study such a table as this No. I, inasmuch as it points out where one can make the greatest saving. Usually, the greatest savings can be made in the items that comprise the largest amount of expense, as for instance, in the buying of the feeder steers. This suggests the old slogan that cattle feeders have sung for a good many decades and that is that "well-bought is half-sold."

TABLE I.—A TYPICAL DISTRIBUTION OF COSTS IN STEER FATTENING.

(Figures Based on Averages Single Steer Basis.)

	Debit or cost items.	Amount of each item.		Percentage distribution of operating cost.	Percentage distribution of net cost.*
I.	Initial cost of feeder steer laid down on farm, 841 pounds, at $8.88 per hundredweight	$74.67			61.0
II.	Operating costs:				
	1. Feed costs: based on feed requirement of the following feeds for 100 pounds gain; 924 lbs. grain or concentrate; 375 pounds dry roughage; 79 pounds corn silage; and 19 days pasture	$36.89		70.0	30.1
	2. Labor costs: based on 2.3 hours man and 1.5 hours horse for the average 100 pounds gain on steer	3.81		7.2	3.1
	3. Building and equipment	1.16		2.2	1.0
	4. Risk	.57	$52.68	1.1	.5
	5. Veterinary and insurance fees	.12		.2	.1
	6. Taxes	.54		1.0	.4
	7. Incidentals	.35		.7	.3
	8. Interest	4.45		8.5	3.7
	9. Marketing expense	4.79		9.1	3.9
	Total cost or total debits	$127.35		100.0 (Operating expense only.)	104.1
	Credits or revenue items.				
I.	Manure	$2.08			—1.7
II.	Hog feed pick-up: based on the pigs picking up 10 percent of the shelled cornor its equivalent, fed to the cattle, the credit being at the rate of $0.52 per bushel	$2.92			—2.4
	Total revenue or total credits	$5.00			—4.1
	Net cost of the 1194-pound steer delivered to the market	$122.35			100.0

* $122.35 used as a basis. The initial costs plus operating costs = 104.1 percent of the total net cost. But the credits amount to —4.1 percent, therefore 104.1 plus —4.1 = 100 percent or total net cost.—JME.

PRICES OF RANGE CATTLE.

For those who feed cattle in the winter, Table II is interesting in that it gives the receipts of range cattle on the Chicago market for 29 years inclusive, by months, this from July to December inclusive; it also covers the average prices of stocker and feeder cattle for the years from 1911 to 1923 together with the price by months of general average native beef cattle for practically the same years.

WHICH FAT STEER DO YOU WANT?

Both these steers were started on feed the same day, but what a difference. Out of some three carloads the top steer was THE BEST KILLING STEER OF ALL.

The Upper Steer.—Isn't he a good 'un? You bet he is. In the 4 months of winter feeding period he gained 393 pounds so that he weighed when the butcher culled him, 1514 pounds, ¾ of a ton.

His daily gain was 3.27 pounds. His daily ration of approximately 16 lbs. shelled corn; 2.5 lbs. linseed oilmeal; a couple ounces of a simple mineral mixture; 30 pounds corn silage; a pound of mixed clover hay; and 3/5 ounce of salt transformed him from a fair to medium feeder in condition to a choice to prime conditioned steer in 120 days.

Note the thickness of flesh particularly over the ribs and hind quarters; the good finish at throat, loin, cod, and buttocks; the uniform and fairly smooth covering; the quiet, substantial, easy disposition; the long, roomy barrel showing feed capacity; the strong under pinning; the "business-like" head denoting strength, stalwartness, substantiality, and feeding stamina.

Yes he's a little "leggy" but that helps him keep above the March and April mud of the sometimes almost "bottomless' farm feedlots when the frost goes out. It's the body that counts in the meat trade, and the substantial legs this steer carries are farm assets.

No, he's not extra well covered over the shoulder, but that's cheap meat. Anyhow he's a good one, range raised, and corn fed; that he is!

The Lower Steer is a "Piker"—and he was THE POOREST KILLING STEER OF ALL. This is the kind to dodge, unless of course one can steal 'em as feeders in the steer selection game. He looks a little like a scared jack rabbit when his tail's up, his back down, and his head held high in a snorting mood. But he wasn't as wild as he looks in this pose, and yet he wasn't much like the highly desirable gentle kind. *Nix!*

In the 4 months of winter feeding he gained only 219 pounds so that when the pole ax stunned him he weighed only 1163 pounds,—a little over a half ton when he went to the killing floor.

His daily gain was only 1.83 pounds even though he had the good daily ration of 17 pounds, shelled corn; 3 pounds whole oats; 1.5 pounds linseed oilmeal; 9 pounds mixed clover hay; and 2/5 ounce salt. He improved but little in condition in the one-third year of heavy forced feeding.

Something the matter? *Yes, The Steer Himself!*

It is our humble judgment that this jack rabbit-like bovine took the gold out of one pocket as fast as the top steers put silver in the other. Note the poor fleshing, particularly in the regions of the high priced cuts, round, rump, loin, and ribs; the spotted, un-uniform covering; the "antelope" disposition; the shallow barrel of low capacity; the "alligator" back; the refined legs; the bullet-like or knot head; and lack of finish throughout.

Certainly he had one good quality, that of life. He has lived so that we could salvage him, and thus reduce somewhat the apparent losses.

It takes "more than" just a good ration to make a choice to prime conditioned steer of Market Topping quality out of a range-bred steer,—and that "more than" is good breeding and good raising up to the feeder steer stage.

It's too bad we should pick such a "poor one," but it's all in the steer feeding game. To keep the percentage of good selections high and the percentage of poor selections, or "run-bys," low, that's the stuff. We can't hit every ball that comes "over the platter" for a home run, but we may logically aspire to have a high batting average.

You bet, that's the winning spirit of the steer feeder.

STANDARD CORN BELT RATIONS ARE HARD TO BEAT.

This well finished and good selling steer is a representative of Group I fed in the winter of 1917-18, and receiving shelled corn and corn silage hand full-fed twice daily, linseed oilmeal 3 pounds, and alfalfa hay practically 2 pounds per head daily with salt self-fed. They outdid all competitors, five other groups fed various commercial feeds, four of them being molasses feeds of different kinds. These steers made the most rapid gains (3.05 per steer daily for 120 days) and returned the largest m a r g i n ($15.11 per steer) over feed costs.

It practically always pays "best" to stick to the home feeds in the feeding of cattle, purchasing only the standard balancers so as to make the farm corn grain, corn silage and legume hay the most efficient. Among the standard "money making" balancers may be mentioned linseed oilmeal, cottonseed meal, whole soybean seed, and soybean oilmeal. Which to purchase depends on the relative price as well as the kind and character of the feeding operation.

THE USE OF A SPECIAL ALFALFA-MOLASSES-LINSEED OILMEAL-COTTONSEED MEAL MIXTURE DID NOT PAY IN THE RATION WHEN FED IN PLACE OF LINSEED OILMEAL.

This feed, as fed to this representative steer of Group V, was presumably too bulky, and did not carry enough real balancing material in its 4 pounds per steer daily to come up to Group I in 1917-18, altho the ration as fed was otherwise identical. This feed was priced at $47.00 the ton but proved to be worth as a linseed oilmeal substitute only 16 cents the ton. Note the lack of finish as contrasted with the Standard Corn Belt Ration fed steer.

TABLE II.—RANGE CATTLE RECEIPTS AND PRICES, CHICAGO.

(Monthly from July to December.)

Month.	Receipts average 29 years, 1895 to 1923 inclusive 000's.	Prices average stocker and feeder cattle 1911-23 per cwt.	Prices general average native beef cattle 1912-23 per cwt.
July	5	$7.20	$10.80
August	43	7.38	11.08
September	79	7.35	11.03
October	87	7.20	10.80
November	44	6.50	10.33
December	8	6.40	9.94

In Table II the average prices of stocker and feeder cattle cover a period of ten years, 1915 being omitted because the market was closed on account of federal quarantine because of the foot and mouth disease.

It is to be noticed in Table II that the high months for the buying of feeding cattle was usually August and September, and that the price of the feeder slopes off after September reaching a low point at the end of the year. It may be likewise noticed that the price of average native feed cattle on the market corresponds fairly closely, insofar as the high and low months are concerned, with the prices of average stocker and feeder cattle. It is human nature to buy feeder cattle on the basis of the present selling values of the fat cattle that are to go on the block; but as a matter of fact the cattle that are bought as feeders do not go on the block for a number of months following their purchase, hence it is not wise to place too much dependence upon the immediate prices of fat cattle on the day that the feeder cattle are purchased.

WEIGHTS OF MARKETED CATTLE.

Table III covers the weight of marketed cattle at Chicago for the 14 years, 1910 to 1923, inclusive. This table is self-explanatory. It follows:

TABLE III.—MONTHLY VARIATIONS IN THE WEIGHT OF MARKETED CATTLE, CHICAGO.

(A Recent Fourteen-Year Average—1910-23 inc.)

January	978 pounds	August	983 pounds
February	993 pounds	September	967 pounds
March	987 pounds	October	961 pounds
April	1009 pounds	November	963 pounds
May	1002 pounds	December	975 pounds
June	1003 pounds	Average (straight)	984 pounds
July	986 pounds		

It may be noted in practice that the "heavy weight" on the average comes on the market in the month of April, May and June, these being the months following the winter feeding, wherein corn is usually poured into the cattle in the feed lots of the Corn Belt. The lightweight months are September, October, November and December, largely because of the heavy runs from the range districts. At this time of the year the supply of fat cattle is relatively light and that accounts for the lower figures as shown in comparison with April, May and June.

MONTHLY PRICES OF FAT CATTLE.

It is interesting to note however that the monthly high prices for fat cattle do not correspond with the heaviness in weight. We will cover this matter in Table IV which follows:

TABLE IV.—TOP PRICES OF BEST STEERS, CHICAGO.

(Monthly Selling Values for a Recent Fourteen-Year Period, 1910-23.)

	Baby beef approximately 700 to 1050 pounds weight.		Medium weights 1200 to 1350 pounds weight.		Heavy weights 1500 to 1800 pounds weight.		Difference in price—baby beef and heavy weights.
The month.	Price per cwt.	Relative value.	Price per cwt.	Relative value.	Price per cwt.	Relative value.	(Heavy weights value minus baby beef values.)
January	$10.91	92.8	$11.14	93.4	$11.45	95.7	$.54
February	10.43	88.7	10.87	91.1	11.06	92.4	.63
March	10.79	91.8	11.06	92.7	11.21	93.7	.42
April	10.95	93.1	11.25	94.3	11.26	94.1	.31
May	10.91	92.8	11.21	94.0	11.18	93.4	.27
June	11.28	95.9	11.47	96.1	11.49	96.0	.21
July	11.68	99.3	11.85	99.3	11.92	99.6	.24
August	12.32	104.8	12.53	105.0	12.54	104.8	.22
September	12.69	107.9	12.73	106.7	12.74	106.4	.05
October	13.06	111.1	13.08	109.6	12.96	108.3	—.10
November	13.08	111.2	12.95	108.5	12.91	107.9	—.17
December	12.97	110.3	13.02	109.1	12.88	107.6	—.09
Average ..... (Straight)	11.76	100.0	11.93	100.0	11.97	100.0	
Range— Low to high	2.65	22.5	2.21	18.5	1.90	15.9	
Range— Jan. to Dec..	2.06	17.5	1.88	15.8	1.43	11.9	

It is of immense interest to note that for the average of the 14 year period, 1910 to 1923 inclusive, that the lowest month of the year for baby beeves, as well as for medium and heavy weight, was February. On the other hand the highest month of the year is to be found in the same season or namely in the late fall season for all three classes of finished cattle, or namely in either October or November.

The baby beef type, beginning in February, gradually increases in value, each succeeding month's price being higher than the preceeding one with the exception of May, until November is reached, after which time the price falls off somewhat during December reaching a lower price in January, and still a much lower price in February. It is of great significance to the baby beef producers to know that the price of baby beeves gradually increases from February to December and hence to plan operations accordingly, basing decision upon knowledge of the cost of production as well as upon the selling value,—keeping in mind clearly all of the time, the margin of profit which is to be experienced.

In the last column of Table IV is found the differentiation or difference between baby beef and heavy weight steer prices. It must be remembered in studying this that we are considering the best grade of steers, in other words the top steers on the Chicago market. During the months of January to September inclusive the heavyweights easily outsold the baby beeves, but during October, November and December the baby beeves outsold the heavy cattle. The heavy cattle as compared to the younger fat stuff sold at relatively the best advantage in the early months of the year, or namely in January, February and March. Part of this difference may be due to the fact that during the early months of the year the heavier cattle are to a large extent short fed and hence do not show the superior finish such as is manifested by the baby beeves that go to market from October to December inclusive. Anyhow this is a very good table to study if one would hit the best market in the long run.

CATTLE FEEDING MARGINS PROPHESIED.

A great many feeders who have had many years of experience in the buying, finishing, and selling of cattle have envolved certain methods of procedure which they practice. Some of these methods are unusually successful because these feeders have fallen into the habit, thru long years of experience, of buying the feeders at such a time that they may be put upon a later market that is very favorable, which means in other words

that they so plan their operation so as to get wide margins, which means big margins relatively, that is a widespread between the purchasing and selling price of the cattle.

In order to get some data upon cattle secured from September to August (by months) and marketed four months later, the cattle being bought in Omaha and sold in Chicago, an average of ten years' prices upon these two markets was figured out. The results are very practical inasmuch as they point the way to a better understanding as regards the margins which may be secured upon September purchased cattle of the top grade as compared for instance to January purchased cattle of a similar grade. Table V giving the cattle feeding margins, Omaha to Chicago, is now presented.

TABLE V.—CATTLE FEEDING MARGINS, OMAHA TO CHICAGO.

Based on a four months' feeding period. Averages by months for 10 years as indicated. (Computed from figures of the Bureau of Agricultural Economics and Chicago Drover's Journal, Year Book of Figures.)

The month of buying.	Initial cost top steers, average 10 years, Omaha per cwt. (av. 1911-20.)	The month of selling.	Final top selling price finished native beef cattle, Chicago per cwt. (av. 1912-21.)	The margin per hundred pounds between markets.
September	$10.48	January	$12.43	$1.95
October	10.27	February	12.18	1.91
November	9.81	March	12.17	2.36
December	9.48	April	12.42	2.94
	Av. 1912-21			
January	9.92	May	12.42	2.50
February	9.72	June	12.48	2.76
March	10.11	July	12.93	2.82
April	10.16	August	13.62	3.46
May	10.02	September	13.84	3.82
June	9.62	October	14.17	4.55
July	9.96	November	14.30	4.34
August	10.35	December	14.29	3.94
Average (straight)	9.99		13.10	3.12

Note that top feeder cattle bought in September for $10.48 sold four months later, presumably as top fat cattle in January for $12.43, thus making a margin of $1.95 per hundredweight. On the other hand cattle which were bought in January for $9.92 sold in May, four months later for $12.42, leaving a margin of $2.50, a greater margin than is experienced by the feeder in September.

It is well to emphasize at this point that we are considering top feeding cattle as well as top selling cattle. Now inasmuch as the margins are very very interesting as regards their variation from month to month it is well to point out that the margins gradually increase on steers bought in September until the December bought steers are brought home, at which time there is a decrease in margin for the January purchased steers. After January the feeder margin increases and keeps on increasing until July when there is a falling off. This means that the feeder steers that are marketed from January to April as fat cattle enjoy increasing margins that is if they are sold practically four months following their purchase and are of top grade. On the other hand the May sold steers show a falling-off in margin as compared to April whereas the steers that are sold from June to November enjoy an increasingly higher price from month to month as the year progresses and also larger margins until the last of November when the margins fall off. Lower margins are experienced for December top steers as compared to November top ones. Of course in practice all steers would not be sold four months subsequent to their purchase, but this Table V gives one a very good insight as to what happens if a definite feeding period is adopted.

One needs to study this whole matter further, however, in order to see what would happen if he sold his steers five months following their purchase, providing of course that he would have top steers at the start and top fat cattle at the finish. If one wishes to figure on a margin for five months, say on steers bought in January, marketing them in June, he can readily do

so. This means then that he will subtract $9.92, the January price of feeders from $12.48, the June price of top fat cattle, which would leave a margin of $2.56 the hundred-weight.

It certainly pays to do a little figuring when it comes to the buying of cattle, not only as regards their buying price, but as regards their selling price some months ahead. It certainly pays to watch the market, both going and coming, so that one can place emphasis upon the periods of profitable spread. One of the most profitable ways to judge the future spread is by the spread which has occurred in years previous, and it is such a study as this as is presented in Table V which we have just been discussing. Naturally, of course, there are a great many other factors of influence which have weight in the determination of the margins to be secured, but we will forego discussing them at this time, simply mentioning a few: (a) Commodity price tendencies, (b) purchasing ability of the consumer, (c) available supplies of feeder steers on the centralized and other markets, (d) carry over of fat cattle in the feeding yards, (e) the cost of labor, man and horse, (f) cost of feeding stuffs, (g) interest rates, (h) psychological situation, whether bullish or bearish, (i) and others.

It must be continuously borne in mind in our study of possible cattle profits and margins that we have the great range or grazing interests to the west of us, this side the Rock Mountains and on the other side too, and that we have the great feeding interests, in the Corn Belt, both vast but widely divergent and very diligent communities in themselves. While one is making money, sometimes the other is losing; the cheaper the Corn Belter buys his cattle from the "growing country", from the open range, the less is the ranchman going to make, or the more is he going to lose. We have here the age old conflicting interests of the buyer and the seller in this cattle feeding business, the ranchman being the seller—the Corn Belter, the buyer of the feeders.

GRADE AFFECTS SEASONAL SELLING VALUES.

Someone recently said to me:: "What are the high months for marketing cattle other than the top grade?" My answer is that that depends on the kind of cattle one has to market. Are you marketing cutter cows or cows of extra good quality, or are you selling prime baby beef? They sell differently,—the different grades, in the various seasons.

The cutter and canner cows have their high point in May and the low point along in November, usually; during the range cattle season when so much of that thin stuff is coming in, these "off grade" cows do not sell very well. Now, with good cows of the top quality and heifers, all of a much better grade than the cutter and canners, the high average month is later, in August; but if you have baby beeves, and I am talking about an average for a good many years, the high month is November, and the low one, February, as we have heretofore pointed out. Good top cattle weighing upwards of the baby beeves have their low point in January or February, usually, and then they increase in value from then on up until after Thanksgiving time, or up until about "International Time" or a little after, when the market slumps, retards to the low point in January or February again. We can thus readily see that the selling price depends upon the kind of stuff one has as to which months are the high market months. The low market months for cutters and canners are good marketing months for the baby beeves.

ABOUT THE FEEDING END—ROUGHAGES.

Now that we have told you about the buying and selling of these cattle, giving you some various pointers which may be of practical importance in the betterment of your business, it behooves us to make a study of some of our feeding experiments, presenting to you the deductions and figures which we have been instrumental in gathering at the Iowa Station for a number of years. We will now proceed to take up the feeding work.

We have done much experimental work in the comparison of different roughages for fattening cattle. In one of our comparative experiments we

used for the coarse portion of the ration,—corn silage, corn fodder, alfalfa hay, red clover hay, mixed clover-timothy hay and timothy hay, all being fed separately to different groups of similar cattle along with shelled corn, cottonseed meal, enough to balance the ration, and common salt. Now, to make a long story short I am going to tell you what the relative values of these roughages in the fattening of two year old cattle were during a four months' feeding period.

To give you a better idea as to how these cattle were finished it may be in order to tell you that they weighed around 1,100 pounds when the experiment started. Three hogs were allowed to follow each group of seven steers during the feeding period of 120 days. The Check Lot, or Lot I, received shelled corn hand-full fed twice daily; plus cottonseed meal, 3 pounds per head daily, given in two equal feeds with the shelled corn; plus corn silage hand-full fed twice daily; plus alfalfa hay self-fed; plus block salt self-fed. The corn fodder lot was fed practically the same as Lot I with the exception that corn fodder was used in place of the corn silage and alfalfa hay roughages. It is well to emphasize in this connection, however, that the Check Lot I consumed on the average approximately 18 pounds of corn, 3 pounds of cottonseed meal, 24 pounds of corn silage and 3 pounds of alfalfa hay per head daily. The block salt consumer per steer in the average 24 hours amounted to .01 of a pound or 1 pound was sufficient to last 100 days.

In the corn fodder lot the average feed consumption was,—shelled corn approximately 16 pounds, cottonseed meal 3 pounds, corn fodder a little more than 8 pounds, and block salt .026 of a pound per steer daily. After paying for the corn, cottonseed meal, corn silage, alfalfa hay and salt in the Check Lot we had a margin over and above feed costs equal to $15.13 per steer; on the other hand in the corn fodder lot we had a much poorer showing, the margin being only $5.79. We figured that with the corn fodder fed cattle that we were losing money because the corn fodder was worth very little as compared to corn silage. The corn fodder was charged at $11.50 per ton but the steers lacked $9.34 of making as much money as the corn silage lot, this means therefore that the corn fodder as turned over to these steers was charged at $9.34 per steer too much. By refiguring this we find that the corn fodder was actually worth less than nothing because we could not have afforded to feed it, even though it was given up for nothing under the conditions of this experiment, that is when the corn fodder was used to replace corn silage and alfalfa hay, the alfalfa being fed in limited quantities. The corn fodder fed steers simply did not gain enough for profit, neither did they finish well enough.

If one is going to use corn fodder it would probably be much better to simply use it liberally at the beginning of the feeding period, and then switch over to a better roughage a little later.

The actual figures show that this corn fodder was worth about $7.00 per ton less than nothing, in other words, in order to have made as much money as the corn silage and Check Lot I, we would have had to have bought the corn fodder for $7.00 less than nothing or putting it still differently the one who asked us to feed the fodder would have had to have paid us $7.00 per ton in order to have permitted the steers to make as much money as where the silage cost $5.50 per ton. This figure seems somewhat exaggerated, and perhaps is, but those are the figures nevertheless.

In this same experiment we compared alfalfa and clover hay and there was but very little difference between these two leguminous hays. What difference did exist were largely due to experimental error as well as to the unavoidable differences in quality which result in collecting two farm hays for comparison.

We have always felt that mixed hay, that is a mixture of clover and timothy, the timothy predominating, is not nearly so good as straight clover. This was shown quite forcefully in this same experiment in that the mixed hay proved to be worth approximately $8.00 per ton as compared to clover

hay at $16.00 per ton. The more timothy there is in the mixed hay the less valuable it is for cattle feeding (fattening) purposes, this being the case even though linseed oilmeal at the rate of two and one-half pounds per steer daily is allowed along with the shelled corn and the mixed hay, as was done in this experiment. The two pounds of linseed oilmeal allowed with shelled corn and clover hay gave much better results than the two and one-half pounds allowed as aforementioned.

As regards timothy hay, our results in this same experiment showed that it was worth less than nothing; whereas the clover fed steers returned a margin of $10.03 per steer over and above feed costs the timothy steers, allowed a little oat straw, and also allowed all the timothy they would eat in place of the clover hay, showed a margin over and above feed costs of only $4.15 per steer. Here we have a difference of $8.26 per steer in favor of clover hay where the clover is charged at $16.00 and the timothy hay charged at $18.00 per ton. Here too, we figured the value of timothy hay as compared to clover and we found that in order to have fed the timothy to advantage we would have necessarily been paid $5.00 a ton for allowing it to these steers. The steers did not do at all well on the timothy. They made only 1.99 pounds per steer daily gain as compared to 2.47 pounds where clover was allowed. Then too, when we went to sell these steers on the Chicago market the clover fed steers easily outsold the timothy fed ones; enough so as to make the big differences which we have shown. If one is going to feed timothy hay we would suggest that it be given to the stocker cattle, or else that it be turned over to the horse mangers.

The premier roughages for cattle feeding are the leguminous ones, such as alfalfa and clover; however, corn silage is a most acceptable non-leguminous roughage. Corn silage is of high feeding value.

Our experience with corn silage has shown it to be worth approximately 40 per cent as much per ton as good timothy or clover hay; or to put it differently we have found in a number of years work with two year old steers, fed 120 to 150 days, that a ton of good well-made corn silage is worth from the replacement value standpoint approximately six hundred pounds of leguminous hay, such as good clover or alfalfa, plus two hundred pounds of corn grain, or a total replacement value equivalent to eight hundred pounds of feed, six hundred pounds of which is roughage and two hundred pounds of which is concentrate. This gives a very high value to corn silage, relatively speaking. When one is able to save two hundred pounds of corn and other grain as well as six hundred pounds of clover or alfalfa hay by the use of a ton of corn silage he can easily figure whether or not it is feasible to grow corn silage under his conditions for cattle feeding (fattening) purposes.

MOLASSES FEEDS COMPARED AND STUDIED.

The question as regards the relative value of different molasses feeds was raised before this meeting started. I have some data along these lines which may be of interest to you inasmuch as we have been conducting considerable work with molasses feeds. We have, at the present time, three years' work in which we have made molasses feed comparisons, comparing a standard corn belt ration with rations of a somewhat similar character carrying molasses feeds.

Our first work with molasses feed was done in 1917 under the leadership of the writer, W. H. Pew, and Russell Dunn. At this time considerable interest was manifested in the state of Iowa on the part of a number of our cattle feeders in regard to ascertaining the value of the various molasses feeds quite widely used in the corn belt at that time. In order to secure some reliable and trustworthy data covering these feeds, experimentation, that is controlled feeding experiments were in order so that we could compare one kind of ration with another. We therefore invited a number of feed manufacturers to enter a test at the Iowa Agricultural Experiment Station wherein their feed would be included with one of the groups of steers on experiment.

THIS IS A MOLASSES FEED FED STEER.

He "also ran," but he and his mates landed in the last place, sixth, in a field of six, returning no margin whatsoever over and above feed costs. This group receiving Champion Molasses Feed in 1917-18 lacked $2.25 per head of paying for the feed fed. The Champion Molasses feed cost $55.00 a ton but would have to have been bought for only $14.70 a ton if this ration (suggested by the Champion folks themselves) would have returned as much margin as the shelled corn — linseed oilmeal — alfalfa hay—salt ration as fed to the group with which they were competing, or namely $15.11 per steer. The Standard "Home Feeds Fed" Ration therefore returned $17.36 per steer more than the cattle fed the "Champion Feed Ration' which carried feeds as follows: Champion Molasses feed—shelled corn—corn silage—alfalfa hay—and salt.

AN ALFALFA-MOLASSES FEED RATION COMES IN THIRD PLACE.

These cattle (of which this steer is a representative) received this ration: CJMCO Alfalfa Molasses Feed about 6 pounds, shelled corn, limited to an average of under 10 pounds during the period, corn silage, full fed twice daily, alfalfa hay in the middle of the day, all they would eat, and wheat straw before the cattle always, with salt self-fed.

This Molasses-Alfalfa feed cost $46.00 but would have had to have been purchased for $21.08 per ton in order to permit these steers to make $15.11 per steer over feed costs as in the Standard Ration fed to group.

THIS STEER LACKS FINISH; HE DIDN'T GET ENOUGH CORN.

He was fed some corn gluten feed, (4.1 pounds per head daily) and he and his mates returned only $14.35 margin per steer, gaining meanwhile only 2.29 pounds per head daily. The corn gluten feed folks' instructions as to how this group should be fed were followed, but the standard corn belt ration lot was ahead at the finish,—weighing more, selling for more, and bringing home more of the coveted *gold.*

Under date of October 9, 1917, each of the five companies having their feed in this test was invited by letter to further the interests of cattle feeding as follows:

"Would your Company welcome a test in which one lot of steers would be fed the ration suggested by your company as the one recommended to farmers feeding cattle, including your.....Feed? If you do welcome such a test where one lot of steers will be fed a ration, (which would be the test lot), of shelled corn, (full fed), linseed meal, (3 lbs.) corn silage, (twice per day according to appetite), alfalfa, and sale, we would be pleased to have the ration which you recommend to the farmers suggested to us, for the feeding of a lot of steers to be compared to the above ration as the basal ration."

On the basis of the recommended rations the groups were fed as follows in competition with Group I handled according to a standard widely-used corn belt feeding method.

THE 1917-18 MOLASSES FEEDS EXPERIMENT.

Six groups of two-year old steers weighing approximately 980 pounds were started on feed on November 22, 1917, these being fed 120 days as follows:

Group I—Shelled corn and corn silage hand full-fed twice daily, linseed oilmeal 3 pounds, and alfalfa hay practically 2 pounds per head daily. Salt.

Group II—*Douglas corn gluten feed* limited to about ¼ full-feed, corn silage full-fed twice daily. Linseed oilmeal 2½ pounds, alfalfa hay 2 pounds per head daily. Salt. Last 30 days gluten increased to 6½ pounds and mixed with 6 pounds shelled corn.

Group III—*Champion Molasses Feed* 6 to 7 pounds, shelled corn about 10 pounds fed twice daily, corn silage limited up to 18 pounds, alfalfa hay, all would eat or about 6 pounds. Salt.

Group IV—*CMJCO Alfalfa Molasses Feed* about 6 pounds, shelled corn limited to average under 10 pounds, corn silage full feed twice daily, alfalfa in middle of day all would eat, wheat straw before cattle always. Salt.

Group V—Same as Group I but *Special Cattle Fattener*, Peters' 4 pounds per head fed in place of 3 pounds linseed oilmeal.

Group VI—*Tarkio Molasses Feed* practically 5 pounds, cottonseed meal up to 4 pounds, corn silage full feed twice daily, alfalfa hay all would eat. Salt. Shelled corn averaged 10 pounds.

The Allotment and Rations as Fed to the Hogs Following Cattle were as follows: The hogs were fed .2 pound of Armour's meat meal tankage on the corn at the night feed, and in addition they were allowed what shelled corn they would take twice daily and still "do a good job" of picking up the grain from the droppings of the steers. A check lot of hogs was fed in dry lot, not following the steers. The check hogs give a basis for determining just how much feed equivalent the pigs following the cattle recovered from the cattle manure. This Check group was fed Shelled Corn (same as the steers received), self-fed, and Armour's meat meal tankage self-fed, and Salt, self-fed.

Table VI gives the data covering the initial weight, final weight, daily gains, daily feed, feed requirement, cost of feeds for the 100 younds of gain, hog credit, selling prices and margins per steer together with other data. It follows.

TABLE VI.—CORN GLUTEN FEED vs. MOLASSES FEEDS IN ALTERING A STANDARD CORN BELT RATION OF SHELLED CORN—LINSEED OIL MEAL—CORN SILAGE—ALFALFA HAY—AND SALT.

Fattening Two-Year Old Steers—Nov. 22, 1917 to March 22, 1918—120 Days.
Six 980-lb. Steers in a Group—Four Hogs Following.
Animal Husbandry Section Results—Iowa Experiment Station.
Figures on Single Average Steer Basis.

Group No.	I	II	III	IV	V	VI
Average initial weight	980	983	978	981	991	986
Average final weight	1346	1258	1255	1261	1241	1305
Average daily gain	3.05	2.29	2.31	2.33	2.09	2.6
Average daily feed:						
Shelled corn	13.7	1.2	10.1	9.5	11.8	10.1
Linseed oil meal	2.9	2.4	.....	.....	.....	.....
Cottonseed meal	.....	.....	.....	.....	.....	3.2
Corn gluten feed	.....	4.1	.....	.....	.....	.....
Molasses feed	.....	.....	7.2	6.2	3.9	5.0
Corn silage	36.3	52.5	17.7	36.9	32.9	33.3
Alfalfa hay	1.5	1.9	6.6	1.4	1.9	2.9
Wheat straw	.....	.....	.....	.00	.....	.....
Block salt	.01	.02	.01	.02	.02	.01
Feed required, 100 lbs. gain:						
Shelled corn	449	53	439	408	568	381
Linseed oil meal	95	106	.....	.....	.....	.....
Cottonseed meal	.....	.....	.....	.....	.....	121
Corn gluten feed	.....	178	.....	.....	.....	.....
Molasses feed	.....	.....	311	264	189	186
Corn silage	1190	2293	767	1582	1577	1251
Alfalfa hay	48	85	286	60	93	109
Wheat straw	.....	.....	.....	.00	.....	.....
Block salt	.4	.7	.6	1.1	1.0	.6
Cost of feed, 100 lbs. gain, excluding hogs	$19.64	$20.98	$26.17	$23.78	$26.40	$24.87
Feed saved per 100 lbs. gain on steers by hogs:						
Shelled corn	5.0	—19.0	25.0	—22.0	25.0	25.0
Meat meal tankage	.5	.9	.8	1.0	.7	.9
Net cost 100 lbs. gain on steers:						
Crediting feed saved by hogs	$19.50	$21.39	$25.54	$23.21	$25.75	$24.21
Crediting hog gains @ $17.00	$17.94	$19.17	$23.40	$21.00	$23.55	$22.29
Necessary selling price steers per 100 lbs. to break even:						
Excluding hogs	$11.96	$11.69	$12.87	$12.36	$12.59	$12.96
Crediting feed saved by hogs	$11.92	$11.78	$12.73	$12.23	$12.46	$12.79
Crediting hog gains at $17.00	$11.50	$11.30	$12.25	$11.74	$12.01	$12.32
Selling price net at Ames, steers per 100 lbs	$13.05	$12.93	$12.55	$12.70	$12.78	$13.14
Margin per steer over feed cost:						
Excluding hogs	$14.59	$15.48	$—4.01 loss	$4.29	$2.40	$2.39
Crediting feed saved by hogs	$15.11	$14.35	$—2.25 loss	$5.90	$4.03	$4.50
Crediting hog gains at $17.00	$20.79	$20.45	$3.66	$12.09	$9.54	$10.63

Feed prices: Shelled corn, $1.35 bu. (14% moisture); linseed meal, $60 ton; cottonseed meal, $56 ton; corn gluten feed, $58 ton; champion molasses feed, $55 ton; CMJCO alfalfa-molasses feed, $46 ton; special cattle fattener, Peters, $47 ton; Tarkio molasses feed, $57 ton; corn silage, $9 ton; alfalfa hay, $25 ton; wheat straw, $10 ton; block salt, $20 ton.

The steers cost $9.10 per hundred, Nov. 22, 1917, the day the test began.

A MIGHTY FINE FINISH BUT IT COST TOO MUCH.

This steer, and his colleagues in Lot VI, outsold all other lots in the experiment, bringing $14.25 per hundredweight, Chicago, in the Spring of 1918, or 10 cents more than the Standard "Home Feeds Fed" cattle,—but the cost of gains after crediting the feed the hogs picked up was $24.21 per hundredweight as compared to $19.50 with the straight Standard Corn Belt Ration as fed in Group I. This big handicap was too big to overcome with a paltry 10 cents a hundred extra selling price.

Yes, these steers were well fed on Tarkio Molasses Feed and others; their ration was on the average, per head daily,—5 pounds Tarkio Molasses Feed, 10.1 pounds shelled corn, 3.2 pounds cottonseed meal, 33.3 pounds corn silage, 2.9 pounds alfalfa hay and salt.

Yes, the Tarkio Molasses Feed cost $57.00 the ton, but in order for the ration as given us by the Tarkio people to make as much margin ($15.11 per steer) as the Standard fed group it would have had to have been bought for only $21.20.

YOU LIKE HIM DO YOU, SO DO WE TOO; AND ISN'T HE A GOOD ONE?

Our mouth waters for a taste of his loin; doesn't yours?

Can you guess what he gained in four months feeding? As you see him he weighs 50 pounds more than three-fourths of a ton, or 1550 pounds, but he lifted the beam at only around 1100 pounds when the feeding started, in the fall time, four months before.

His ration was composed of shelled corn, the majority being yellow, full-fed, 1½ pounds linseed oilmeal daily fed in two feeds on the corn, alfalfa hay full-fed twice daily, and block salt.

This handsome "Money Maker" was the best steer in his group of seven, the average daily gain of which averaged 3¼ pounds per steer.

Note his wonderfully capacious (feed holding) middle; thick, uniform, mellow covering of meat thruout, particularly outstanding in the loin region where the family cuts, when handed over the butcher's counter, wreck a five dollar bill; characteristics of good breeding; good quality and weight of hide; and placid quiet, fine "feeding disposition."

When in the "Feeder Form" this steer showed much promise, and so when he developed in such a fine manner in the feed yards he lived up to his "promise" as a feeder—which means that good judgment, rightly exercised, as regards the selection of the steers for the feed yards is worth a mint of golden dollars to the cattle feeder.

To buy the right kind of feeders at the right price and at the right time counts big in the building of bovine profits.

Table VII gives the selling value together with the shipping shrinkage, and dressing percentages. It follows:

TABLE VII.—SELLING, SHIPPING AND SLAUGHTER DATA.

Corn Gluten vs. Molasses Feeds in Allowing a Standard Corn Belt Ration of Shelled Corn—Linseed Oilmeal—Corn Silage—Alfalfa Hay—and Salt.

Lot No.	I	II	III	IV	V	VI
Actual selling value Chicago per cwt.	$14.15	$13.90	$13.75	$13.90	$13.80	$14.25
Shipping cost per cwt; (represents the difference between Chicago selling (shrunk) and Ames net (unshrunk) values per cwt.)	$1.10	$.97	$1.20	$1.20	$1.02	$1.11
Shrinkage—End of experiment to Chicago (Ames to Chicago) March 22, 1918* to March 29, 1918†						
Per head (pounds)	56.12	40.88	58.33	58.83	44.33	49.78
Percent	4.17	3.25	4.65	4.67	3.57	2.82
Shrinkage enroute (Ames to Chicago) March 27, 1918‡ to March 29, 1918†						
per head (pounds)	70.00	61.67	80.00	85.00	78.33	71.67
Percent	5.15	4.82	6.27	6.61	6.14	5.40
Dressing percentage cold weights:						
Based on Ames weights*	57.56	57.33	58.38	56.53	59.12	63.86
Based on Chicago weights	60.06	59.26	61.23	59.29	61.31	61.30

* Average three weights, end of experiment.
† Chicago group weight.
‡ Final group weight on loading day.

Table VIII gives a description of the feeds with comparative ingredients, guaranteed analyses, and actual analyses as determined from the samples taken during the experimntal period and analyzed by Professor Gaessler and Associates of the Chemistry Section of this Station. Table VIII follows:

TABLE VIII.—DESCRIPTION OF THE COMPETITIVE FEEDS USED.

The feeds used and the manufacturer.	Declared ingredients.	Guaranteed analysis percentages. Protein (not less than), fat (not less than), fibre crude (not more than).		
		Protein.	Fat or ether extract.	Fibre crude.
Douglas Corn Gluten Feed (Douglas Co., Cedar Rapids, Iowa).	A by-product of the starch and corn oil manufacture.			
	Guaranteed analysis	23.0	1.0	8.0
	Actual analysis	27.69	1.34	8.60
Champion Molasses Feed (Champion Milling Co., Clinton, Iowa).	Ingredients; Southern cane molasses, charred peat, ground flax and grain screenings, wheat bran, ground corn and cottonseed.			
	Guaranteed analysis	11.0	2.0	8.0
	Actual analysis	9.02	2.61	11.67
CJMCO Alfalfa-Molasses (C. J. Milligan Co., Sioux City, Iowa).	Ingredients: Alfalfa meal and cane molasses.			
	Guaranteed analysis	11.0	1.0	45.0
	Actual analysis	11.14	1.08	17.16
Tarkio Molasses Feed (Tarkio Molasses Feed Co., Kansas City, Mo.)	Ingredients: Cane molasses, flax screenings, ground corn, wheat bran and charred humus.			
	Guaranteed analysis	9.0	2.0	8.0
	Actual analysis	10.26	1.65	8.67
Peter's Special Cattle Fattener (M. C. Peter's Mill Co., Omaha, Nebr.)	Ingredients: Ground alfalfa, beet molasses, linseed oilmeal, cottonseed meal.			
	Guaranteed analysis	Protein.	Fat or ether extract. Special	Fibre crude.
	Actual analysis	14.13	2.53	16.79

STANDARD FEEDS WIN OUT EASILY.

A careful study of this data shows clearly that the standard corn belt ration was instrumental in producing not only the most rapid gains but also the most economical and profitable gains. The second best lot was the lot receiving corn gluten feed, but it must be noted in this connection that the corn gluten feed fed was very small in amount and the shelled corn was also "small". In this particular year, the spread between well-finished and only well to moderately finished cattle was very slight, and hence Lot II receiving the corn gluten feed did very well on the limited grain ration. The results between Lots I and II however are very close.

All of the molasses feed fed lots did not do very well proportionately, the profits being less than one-third as much as in the standard corn belt group, or namely Lot I, in all cases excepting one, or namely Lot IV which received the CMJCO Alfalfa Molasses feed. This is a molasses feed made up of straight alfalfa and cane molasses. One molasses feed fed group, namely group III, receiving Champion Molasses feed actually showed a loss of $2.25 per steer, in other words the steers on the average in this lot lacked $2.25 of paying for their feed after they were sold and the cost of the original steers subtracted.

In spite of the fact that Lot VI receiving Tarkio Molasses Feed sold for the highest price of all of the steers in the experiment yet this particular lot did not make nearly so large a profit as the lot receiving the standard corn belt feeds consisting of shelled corn, corn silage, and alfalfa hay, these being supplemented with linseed oilmeal and block salt.

This experiment as well as others strongly indicates that one will do well to depend upon his home grown feeds, and to buy only such protein and mineral supplements as are needed to balance the ration. Two of the good protein supplements which "do the business" in cattle feeding are linseed oilmeal and cottonseed meal. Now-a-days with soy beans coming on to the scene the use of whole soy beans in place of linseed oil meal or cottonseed meal is to be considered as good practice. The use of soy bean oil meal is also to be recommended when the price is right, comparatively speaking.

VALUE OF THE MOLASSES FEEDS FED.

Sometimes we are asked as to how much we could afford to pay for the various molasses feeds and still make as much margin as was made for instance in Lot I receiving the standard corn belt ration of corn, linseed oilmeal, corn silage, alfalfa hay and salt.

Well, we figured this out in this experiment and the results are very interesting.

A word as to the method of figuring is in order. Lot V, for instance, receiving the Special Cattle Fattener, a feed by the way which was not put on the open market but was simply entered in this lot as an experimental feed mixture, returned a margin of $4.03 over and above feed costs. This was very much less than the margin returned by Lot I, or figuring it out it is $11.08 less. This means therefore that the molasses feed that was fed to each steer in this group would have had to have been bought for $11.08 less in order that the steer should be permitted to make as good a showing on the average as the average steer in Lot I. The Special Cattle Fattener actually cost $47.00 but when the correction as indicated is made and deductions applied it is found that the molasses fattener, that is the Special Cattle Fattener, would have had to have been bought for 16 cents a ton in order to allow the steers in that group to make as good a showing as the steers in Lot I, or namely to make $15.11 per steer over and above feed costs. We are using the middle figure (see Table VI) under margin entitled "Crediting feed saved by hogs" in getting these figures because that is the most reliable and sensible figure to use in this work. If any one cares to use the other figure for margin or namely the one "crediting hog gains," he can do so.

A STANDARD CORN-BELT RATION AGAIN EXCELLS ALL OTHERS UNDER TEST.

These two steers are representatives of Groups I (above) and Group II (below) receiving respectively these rations in the winter of 1918-19 for a 120 day feeding period:

Group I.—*Standard Cornbelt Full-Fed Ration* — Shelled corn hand full-fed twice daily, plus linseed oilmeal 3 pounds per head given in two feeds and fed on corn silage, plus corn silage hand full-fed twice daily, plus alfalfa hay, what the cattle would clean up over night, plus block salt at free-will.

Group II (Ration suggested by the Douglas Co.) — *Douglas Corn Gluten Feed Ration* — (Douglas Co., Cedar Rapids) Corn gluten feed 3 to 4 pounds per head daily, mixed with 1 to 2 pounds of linseed oilmeal per head daily and given in two feeds in open bunk, plus 4 to 6 pounds of shelled corn per steer daily, last 60 days, given in mixture with gluten feed and oilmeal in open bunks, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt at free-will.

The "Farmer's Choice" (Group I) returned a margin of $18.45 per steer over feed costs whereas Group II was a poor second with a little more than half as much margin, or $10.00 per steer. The use of Corn Gluten Feed Ration as it "panned out" did not pay. Group II would probably have done much better if more corn grain would have been allowed judging from the finish attained.

THE "MOLASSES FEEDS" RATIONS DID POORLY AGAIN.

These steers are representative ones of Group III (below) and Group IV (next page) fed respectively on rations suggested by the Feed Manufacturers, in 1918-19, whose feeds were fed, this as per their instructions, or as follows:

Group III.—*Champion Molasses Feed Ration*—Champion Molasses Feed 5 to 7 pounds per steer daily given in mixture with shelled corn 8 to 10 pounds per head daily in open bunk, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt at free-will.

Group IV.—*CJMCO Alfalfa-Molasses Feed Ration*—(Milligan, Sioux City) CJMCO Alfalfa-Molasses Feed 4 to 5 pounds per head daily in mixture with shelled corn started at 6 pounds and increasing to a full feed per head daily, given in two feeds in

open bunk, plus 2 to 3½ pounds of linseed oilmeal given in two feeds on silage, plus corn silage limited to 15 to 20 pounds per head daily given in two feeds, plus alfalfa hay at free-will, plus Sal-Tonik Salt Block at free-will.

The cattle in Group III ate Champion Molasses Feed during the winter of 1918-19 at a cost of $47.70 a ton but they paid back only $27.48 of this, as compared to Group I, which paid full value for all feeds fed, and still had a margin of $18.45 per steer. The "Champion" cattle showed a margin of $10.40 when the Molasses feed (Champion) was charged to them at $47.70 a ton; but when it was cut in price the Champion figured to $27.48 a ton, these cattle, too, returned $18.45 per head. We think the Champion people made a mistake in their suggested ration in that they did not suggest any linseed oilmeal or cottonseed meal to be fed. But that is opinion. The results are factual,—no theory in them.

The "Alfalfa-Molasses Feed fed" cattle in Group IV lost money of $9.63 per head after paying for the feeds fed only. This molasses feed cost $44.50 per ton, and even tho it had been fed in the ration they suggested as a "gift" the steers would still have been far behind Group I. These cattle would have returned the $18.45 margin of Group I had they been given the molasses feed free, and then credited with $60.36 for every ton of the Alfalfa-Cane Molasses mixture as allowed.

Evidently this was not a good showing for the CJMCO Alfalfa-Molasses Feed ration as well as the Champion Feed Ration.

THE FINISH IS NOT SO BAD CONSIDERING HIS GROUP RECEIVED NO DRY SHELLED CORN.

These steers of Group VII returned a plus margin of $14.55 over and above feed costs, a margin higher, in 1918-19, even at that than any of the rations carrying molasses feeds; yet these cattle got no dry corn grain in the open feed bunk, receiving only the soft natural corn kernels of the corn silage. These cattle were outsold by the Group I cattle full-fed on shelled corn, otherwise handled very much the same by $1.50 the hundredweight or $17.50 as contrasted with $16.00. These cattle consumed on the average per head daily during the 120 days feeding,—3 pounds linseed oilmeal, 52 pounds corn silage, 1.5 pounds alfalfa hay, and .03 pounds salt, as compared to the full fed cattle of Group I, or 15 pounds less corn, the same oilmeal, 24.6 pounds more corn silage, 3/5 pound more hay, and the same salt. They gained 2.7 pounds per head daily as compared to 3.0 pounds with the full "shelled corn" fed cattle.

When the spread is small between prime and good cattle then the limited grain works well with the corn silage and linseed or cottonseed oilmeal; but be sure to allow a good protein supplement like these oilmeals,

Figured on the basis as given we could have afforded to pay for each ton of commercial feed as follows:

Lot II—Douglas Corn Gluten Feed $54.90; it cost $58.00.

Lot III—Champion Molasses Feed $14.70; it cost $55.00.

Lot IV—CJMCO Alfalfa Molasses Feed $21.08; it cost $46.00.

Lot V—Special Cattle Fattener (Peters) $.16; it cost $47.00.

Lot VI—Tarkio Molasses Feed $21.20; it cost $57.00.

The $54.90, $14.70, $21.08, $0.16 and $21.20 values as given means that the feeder would have had to have purchased these respective feeds at these prices in order to enable him to make the same margin, over and above feed costs, as the steers fed on the Standard Corn Belt Ration, or $15.11 per steer.

The prices charged for these commercial feeds shows that they actually returned, on this basis of figuring, much less than they cost.

It is to be remembered that the cattle in the various commercial feed lots were fed according to the specific instructions from each commercial feed manufacturer; we assume that the feed manufacturers ought to know how to feed their feeds to good advantage, hence some may be the more surprised that the "Home Ration" came out first, easily.

The chemical composition of the feeds used is given in Table IX which follows:

TABLE IX.—CHEMICAL COMPOSITION OF FEEDS USED.

1917-18 Experiment.

	Chemical number.	Water.	Dry matter.	Crude protein.	Nitrogen free extract.	Crude fibre.	Fat or ether extract.	Ash.
Shelled corn	(659)	*11.91	88.09	9.01	71.94	2.70	3.10	1.34
14% basis		**14.00	86.00	8.80	70.23	2.64	3.03	1.31
Linseed oilmeal....	(621)	9.37	90.63	33.19	33.92	9.97	6.80	6.75
Cottonseed meal....	(661)	8.06	91.94	33.27	30.71	14.09	8.15	5.69
Corn gluten feed...	(662)	7.27	92.73	27.69	51.23	8.60	1.34	3.87
Champion molasses feed	(663)	24.23	75.77	9.02	44.93	11.67	2.61	7.54
CJMCO molasses feed	(664)	21.10	78.90	11.14	40.39	17.16	1.08	9.13
Alfalfat	(665)	8.93	91.07	14.13	47.96	16.79	2.53	9.65
Tarkio molasses feed	(666)	20.34	79.73	10.26	52.55	8.67	1.65	6.61
Alfalfa hay	(642)	10.39	89.61	15.24	33.66	30.14	2.13	8.44
Wheat straw.....	(730)	6.54	93.46	5.03	38.23	37.11	1.67	11.42
Corn silage.....	(644A)	71.86	28.14	2.10	16.68	7.15	.79	1.42
	(717)	68.21	31.79	2.43	19.50	7.45	.86	1.56

* As fed.

** Computed to and charged in the experiment on this basis, thus insuring uniform figures.

It is to be noted that the Champion Molasses Feed ran a little better than 24 per cent moisture. The CJMCO Molasses Feed, a little over 21 per cent; and the Tarkio Molasses Feed a little over 20 per cent. The corn as it is charged in this experiment ran only 14 per cent moisture although actually as it was fed it ran less than 12 per cent. The corn figures have been computed to a 14 per cent moisture basis. None of the concentrated feeds ran as high in water as did the molasses feed. When we consider that the Champion Molasses feed, for instance, is practically one-fourth water as it was used in this test we can readily see that the dry matter percentage is much less than in linseed oilmeal or shelled corn, and it is the dry matter that does the real nutritional business. We can pump the water from our wells cheaper than freighting it home in the bag.

THE 1918-19 MOLASSES FEEDS TEST.

In the year 1918-19 we ran another experiment in which we compared the various molasses feeds that were entered in the test. In this particular test four of the sweet feeds were enterd as was also corn gluten feed. Two checks were run against the molasses feed and the corn gluten feed, one of them receiving a full-fed ration, Lot I, and the other, Lot VII, receiving a ration without any corn grain being fed whatsoever.

After all, when we want to determine the real value of feeds and to get the figures which represent these relative values it is necessary to resort to

comparative feeding trials. No other method satisfies the accurate thinker and worker. Actual experiment counts high in forcing the correct decision, particularly when these experiments are carried on under the same roof, the feed yards adjoining one another, and the steers handled as nearly alike as is practically possible.

In order to carry out our work this year therefore, that is of 1918-19, we again invited the manufacturers of five different molasses feeds and also Corn Gluten Feed to come in. All the feeds entered in the test last year are included again this year, with one exception, Tarkio, they declining our invitation, giving as their reason that they were so far behind with their orders, and that their customers were so anxious for Tarkio that they needed every pound to fill their demands. This test would have taken about one and a half tons. It will be remembered that the Tarkio fed cattle last year ranked fourth in the test, although their cattle sold for the highest price of any of the cattle. The margin per steer in the Tarkio lot last year was $4.50 over feed costs, as compared to $15.11 in the Standard Cornbelt Ration.

The Golden Rule Molasses Feed was added in this year's test.

In inviting the different companies, we said,—"We will turn one lot over to each company and feed the cattle in that lot as per their instructions .....the manner and method in which the lots.....are to be fed is left entirely to the pleasure of each commercial feed company represented and the only request made is that the additional feeds used be limited as far as possible to those feeds fed in Lots I and VII."

The seven groups of five steers each were fed for 120 days as follows:

Group I—*Standard Cornbelt Full-Fed Ration*—Shelled corn hand full-fed twice daily, plus linseed oilmeal 3 pounds per head given in two feeds and fed on corn silage, plus corn silage hand full-fed twice daily, plus alfalfa hay, what the cattle would clean up over night, plus block salt at free-will.

Group II—*Douglas Corn Gluten Feed Ration*—(Douglas Co., Cedar Rapids) Corn gluten feed 3 to 4 pounds per head daily, mixed with 1 to 2 pounds of linseed oilmeal per head daily and given in two feeds in open bunk, plus 4 to 6 pounds of shelled corn per steer daily, last 60 days, given in mixture with gluten feed and oilmeal in open bunks, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt.

Group III—*Champion Molasses Feed Ration*—Champion Molasses Feed 5 to 7 pounds per steer daily given in mixture with shelled corn 8 to 10 pounds per head daily in open bunk, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt at free-will.

Group IV—*CJMCO Alfalfa-Molasses Feed Ration*—(Milligan, Sioux City) CJMCO Alfalfa-Molasses Feed 4 to 5 pounds per head daily in mixture with shelled corn started at 6 pounds and increasing to a full feed per head daily, given in two feeds in open bunk, plus 2 to 3½ pounds of linseed oilmeal given in two feeds on silage, plus corn silage limited to 15 to 20 pounds per head daily given in two feeds, plus alfalfa hay at free-will, plus Sal-Tonik Salt Block at free-will.

Group V—*Alfal-Fat (Alfalfa-Molasses) Ration*—(Peters, Omaha) Alfal-Fat 2 to 4 pounds per head daily given in two feeds on second silage allowance given after grain morning and evening, plus shelled corn during the last 90 days, gradually increasing up to 6 pounds per head daily, this given in two feeds and fed in open bunk, plus linseed oilmeal 3 pounds per head daily, given in two feeds on the first silage allowance given before other feeds morning and evening, plus corn silage hand full-fed twice daily, plus oat straw at free-will, plus block salt at free-will.

Group VI—*Golden Rule Molasses Feed Ration*—(U. S. Stock Food Company, Kansas City, Mo.) Golden Rule 5 to 9 pounds per head daily given in two feeds on silage, plus shelled corn limited to about 2 pounds daily in the first 60 days, then increased to about 6½ pounds the next 30, and then to full-feed, approximately 12 pounds the last 30, given in two feeds daily with silage, plus whole oats 4 pounds per head daily beginning the second 30 days, 6 pounds the third 30 days, 1 pound the fourth 30 days given

in two feeds on silage, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt at free-will.

Group VII—*"No-Grain" Ration—Straight Linseed Oilmeal—Corn Silage —Alfalfa Hay—Salt (The Farmers' Ration)* Linseed oilmeal 3 pounds per head daily given in two feeds on silage, plus corn silage hand full-fed twice daily, plus alfalfa hay what the steers would clean up over night, plus block salt at free-will.

In all groups silage both morning and evening feeds was allowed the first thing, then grain was fed and finally, with those cattle not limited on silage, a second helping of this popular feed was given, providing the cattle showed an inclination for it.

ALLOTMENT AND RATIONS FED TO HOGS FOLLOWING CATTLE.

The hogs were fed .2 pound of Armour's meat meal tankage on the corn at the night feed, and in addition they were allowed what shelled corn they would take twice daily and still "do a good job" of picking up the grain from the droppings of the steers. A check lot of hogs was fed in dry lot, not following the steers. The check hogs give a basis for determining just how much feed equivalent the pigs following the cattle recovered from the cattle manure. This Check group was fed Shelled Corn (same as the steers received), self-fed and Armour's meat meal tankage self-fed, and Salt, self-fed.

The feeding results for the current trial 1918-19 are given herewith in tabular form, Table X:

TABLE X.—STANDARD CORN BELT RATION vs. MOLASSES FEED AND CORN GLUTEN FEED.

ALTERATIONS vs. "NO GRAIN" RATION.

Fattening Two-Year-Old Steers—Dec. 27, '18 to Apr. 26, '19, 120 Days.
Five 1000-Pound Steers in a Group—Three Hogs Following.
Animal Husbandry Section Results—Iowa Experiment Station.
Figures on Single Average Steer Basis. (Pounds and Dollars.)

Lot No.	I	II	III	IV	V	VI	VII
Av. final wt.	1360.1	1288.2	1279.2	1268.3	1298.9	1258.3	1335.
Av. daily gain	2.98	2.40	2.33	2.23	2.51	2.20	2.74
Av. daily feed							
Shelled corn	15.0	2.6	8.7	9.9	3.6	5.11	.....
Whole oats	.....	.....	.....	.....	.....	2.0	.....
Linseed oil meal	3.0	1.8	.....	2.4	3.0	.....	3.0
Corn gluten feed	.....	3.3	.....	.....	.....	.....	.....
Molasses feed	.....	.....	6.6	4.5	3.0	7.1	.....
Corn silage	27.4	40.5	31.8	17.0	42.9	33.7	52.0
Alfalfa hay	.9	1.0	1.0	6.5	.....	1.0	1.5
Oat straw	.....	.....	.....	.....	.03	.02	.....
Block salt	.03	.02	.02	.01	.04	.04	.03
Feed required, 100 lbs. gain							
Shelled corn	504.7	110.2	373.9	445.2	143.5	233.9	.....
Whole oats	.....	.....	.....	.....	.....	91.0	.....
Linseed oil meal	100.8	73.0	.....	107.9	119.6	.....	109.6
Corn gluten feed	.....	135.6	.....	.....	.....	.....	.....
Molasses feed	.....	.....	285.1	200.3	119.6	321.3	.....
Corn silage	919.8	1689.6	1365.4	763.7	1711.6	1535.0	1899.1
Alfalfa hay	31.6	42.6	42.5	290.3	.....	45.0	56.0
Oat straw	.....	.....	.....	.....	1.4	.7	.....
Block salt	.88	.84	.72	.30	1.58	1.68	.93
Cost of feed, 100 lbs. gain							
Excluding hogs	22.60	20.10	25.32	28.71	20.43	25.99	16.08
Feed saved per 100 lb. gains on steers by hogs							
Shelled corn	44.0	15.5	51.9	90.5	21.6	44.7	—10.2
Meat meal tankage	2.5	2.8	3.2	3.9	2.7	3.2	2.2
Net cost, 100 lbs. gain, steers							
Crediting feed saved by hogs	21.32	19.54	23.80	26.15	19.73	24.65	16.22
Crediting hog gains @ $20.00	19.79	17.67	21.84	23.22	17.93	22.59	14.80
Necessary selling price, steers per 100 lbs. to break even							
Excluding hogs	15.34	14.39	15.49	16.11	14.53	15.53	13.57
Crediting feed saved by hogs	15.00	14.26	15.16	15.58	14.37	15.25	13.60
Crediting hog gains @ $20.00	14.60	13.85	14.73	14.96	13.95	14.81	13.25

Selling price, net, Ames, steers per 100 lbs.....	16.36	15.04	15.98	14.82	14.97	15.01	14.69
Margin per steer over feed cost							
Excluding hogs	13.89	8.41	6.16	—16.46	5.74	—6.51	15.02
Crediting feed saved by hogs...	18.45	10.00	10.40	—9.63	7.86	—2.99	14.55
Crediting hog gains @ $20.00...	23.93	15.35	15.88	—1.78	13.27	2.46	19.23

The prices of the feeds used in this test were as follows: Shelled corn, $1.45 (14 per cent moisture basis); whole oats, 64 cents; linseed oil meal, $70.00; Douglas corn gluten feed, $57.40; champion molasses feed, $47.70; CJMCO alfalfa-molasses feed, $44.50; Peters' alfal-fat (alfalfa-molasses), $37.40; golden rule molasses feed, $51.10; Armour's meat meal tankage, $110.00; corn silage, $12.00; alfalfa hay, $30.00; oat straw, $10.00; block salt, $1.00 a cwt.; sal-tonik salt, $5.00 a cwt. Sacks were credited at $2.50 per ton for commercial feeds only.

The steers cost $12.75 per hundred, delivered Ames on December 27th, 1918, the day the test began.

The selling, shipping and slaughter data are given in Table XI, which follows:

TABLE XI.—SELLING, SHIPPING AND SLAUGHTER DATA.

Standard Corn Belt Ration vs. Molasses Feed and Corn Gluten Feed Alterations vs. "No GRAIN" RATION.

Lot No.	I	II	III	IV	V	VI	VII
Actual selling value, Chicago per cwt..	17.50	16.25	17.25	16.25	16.50	16.25	16.00
Shipping cost per cwt: (Represents the difference between Chicago selling (shrunk) and Ames net (unshrunk) values per cwt.)....	1.14	1.21	1.27	1.43	1.53	1.24	1.31
Shrinkage—End of experiment to Chicago (Ames to Chicago), April 26, 1919* to May 1, 1919**							
Per head (pounds).....	50.06	54.20	55.20	68.26	78.94	54.26	65.20
Percent	3.68	4.21	4.32	5.38	6.08	4.31	4.88
Dressing percentage cold weights:							
Based on Ames weights*.....	58.16	55.97	57.61	56.25	56.91	57.91	54.94
Based on Chicago weights**.....	60.38	58.43	60.21	59.45	60.59	60.51	57.76

* Average three weights, end of experiment.
** Chicago group weight on loading day.

The description of the competitive feeds as used is given in Table XII. This follows:

TABLE XII.—DESCRIPTION OF THE COMPETITIVE FEEDS USED.

The feeds used and the manufacturer.	Declared ingredients.	Guaranteed analysis percentages. Protein (not less than), fat (not less than), fibre crude (not more than).		
		Protein.	Fat or ether extract.	Fibre crude.
Douglas Corn Gluten Feed, (Douglas Company, Cedar Rapids, Iowa).	A by-product of the starch and corn oil manufacture.			
	Guaranteed analysis....	23.0	1.0	8.0
	Actual analysis.....	25.90	4.40	8.63
Champion Molasses Feed, (Champion Feed Milling Company, Clinton, Iowa).	Ingredients: Southern cane molasses, charred peat, ground flax and grain screenings, wheat bran, ground corn and cottonseed meal.			
	Guaranteed analysis....	11.0	2.0	8.0
	Actual analysis.....	11.49	2.63	15.69
CJMCO Alfalfa Molasses, (C. J. Milligan Co., Sioux City, Iowa).	Ingredients: Alfalfa meal and cane molasses.			
	Guaranteed analysis....	11.0	1.0	3.50
	Actual analysis.....	9.61	2.30	6.95
Peter's Alfalfat, M. C. Peters Mill Co., Omaha, Nebraska).	Ingredients: Alfalfa meal and beet molasses.			
	Guaranteed analysis....	10.0	.5	26.0
	Actual analysis.....	10.77	2.02	30.54
Golden Rule Molasses Feed, (United States Stock Food Co., Kansas City, Mo.)	Ingredients: Molasses, linseed oil meal, corn, cottonseed hulls, wheat bran, ground screenings and humus.			
	Guaranteed analysis....	15.0	3.0	9.0
	Actual analysis.....	11.30	4.23	13.59

TWO MORE MOLASSES MIXED FEEDS MAKE RELATIVELY POOR SHOWINGS IN 1918-19 EXPERIMENT.

These representative steers as well as their mates, and as were all the other steers, fed the rations as outlined by the Molasses Feed concerns were behind in the race against the Standard Corn Belt Ration fed Group I. These two groups were fed in this wise:

Group V.—*Alfal-Fat (Alfalfa-Molasses) Ration*—(Peters, Omaha) Alfal-Fat 2 to 4 pounds per head daily given in two feeds on second silage allowance given after grain morning and evening, plus shelled corn during the last 90 days, gradually increasing up to 6 pounds per head daily, this given in two feeds and fed in open bunk, plus linseed oilmeal 3 pounds per head daily, given in two feeds on the first silage allowance given before other feeds morning and evening, plus corn silage hand full-fed twice daily, plus oat straw at free-will, plus block salt at free-will.

Group VI.—*Bolden Rule Molasses Feed Ration*—(U. S. Stock Food Company, Kansas City, Mo.) Golden Rule 5 to 9 pounds per head daily given in two feeds on silage, plus shelled corn limited to about 2 pounds daily the first 60 days, then increased to about 6½ pounds the next 30 days, and then to full-fed, approximately 12 pounds the last 30, given in two feeds daily with silage, plus whole oats 4 pounds per head daily beginning the second 30 days, 6 pounds the third 30 days, 1 pound the fourth 30 days given in two feeds on silage, plus corn silage hand full-fed twice daily, plus alfalfa hay what the cattle would clean up over night, plus block salt at free-will.

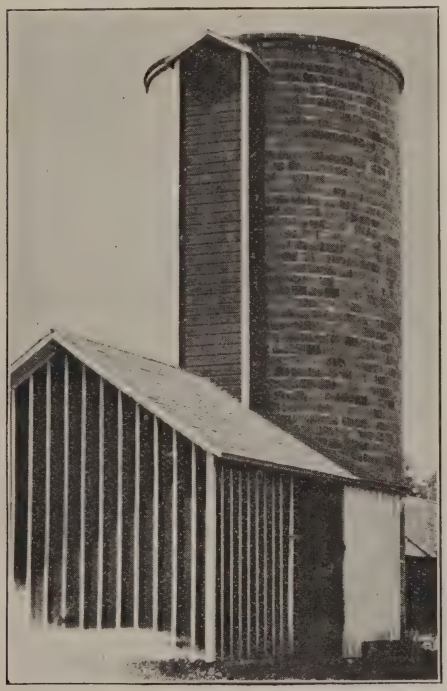
The margin over feed costs in the Alfal-Fat group was $7.86; and in the Golden Rule group $—2.99 (loss). Contrast this with the $18.45 plus margin of the Group I fed farm feeds balanced with linseed oilmeal. The Alfal-Fat cost $37.40 the ton but that was apparently too much; if $21.39 were credited the steers for each ton fed then, the steers would have returned $18.45 per head over feed costs. This means that this feed "did more harm than good." It would have been better, we take it, to have fed this and the other Molasses feeds to the horses or dry cows because they would probably have yielded much more that way. Every feed, as every nut on an auto, must fit into its place; to feed oat straw to laying hens is hardly a sane procedure but the wintering horses can cash in on it.

The Golden Rule feed, apparently, according to the salesman,—a foot long and a yard wide,—did not "produce" profitably. These cattle lacked $2.99 per head paying for the feed they ate, the Molasses Feed, Golden Rule, being charged at $51.10, its regular price to farmers. However had the feed cost 51 cents a ton these cattle would have done as well financially as the Standard farm feeds fed Group I, with which they were competing, or would have made $18.45 per head over and above feed costs.

Sweet feeds such as "mixed" molasses feeds should be purchased with caution, that is for no more than they are actually worth, otherwise the returns over and above cost may not be so "sweet" after all.

THE SILO IS A VALUABLE ASSET IN BEEF PRODUCTION WHEN WISELY FITTED INTO THE FARM SCHEME AND EFFICIENTLY USED.

There was once a slogan "A Silo for Every Farm" promulgated by certain intellectuals, and such a notion is extant in some "heavily wooded" quarters. It would be equally as ludicrous and comical to have these slogans: "A Windmill for Every Farm," or "Herefords for Every Range," or "An Electric Copper Washer for Every Home."



But the silo is O. K. when it is rightly utilized—and actually needed—in the corn country, yet there are many farms that have no more use for a silo than they do for a Pecan tree, or an Orange grove.

Our experience has been that Corn Silage, when properly balanced and correctly fed, has been worth, as an average of some dozen years of practical and truth telling feed lot experience, approximately forty percent as much per ton as good clover or alfalfa hay. We have found that a ton of well made corn silage, coming from land yielding from 40 to 70 bushels of corn to the acre, has replaced, that is taken the place of some two hundred pounds of high priced concentrates and six hundred pounds of the leading legume hays, alfalfa or clover in the fattening of two-year-old steers in a feeding period of from 120 to 150 days.

Yet, even at that, many farms had best be not decorated with a silo.

SOME LESSONS FROM 1918-19 TESTS.

It is now well to look to some of the lessons gleaned from the 1918-19 test briefly enumerated:

1. The Standard Corn Belt Ration produced the most rapid gains 2.98 pounds daily, the best Commercial Feed group averaging only 2.51 pounds and the poorest commercial group 2.20.

2. The Standard Corn Belt Ration produced the highest finish and the most weight so that the cattle were sold at $17.50 per hundred, Chicago, this being $1.50 a hundred above the least valued Commercial Feed group and 25 cents a hundred above the best of all the groups.

3. The Standard Corn Belt Ration permitted a margin per steer over feed costs of $18.45 after crediting feed saved by hogs, this margin being excelled by no other group, not even the "No Grain" Group VII—a group fed practically the same as Group I with the exception that no corn was allowed.

4. The "No-Grain" group ranked second in gains with 2.74 per hundred daily, this group excelling all of the commercial feed groups receiving grain. This group returned a margin per steer after crediting hog feed saved of $14.55. Even tho these "No-Grain" cattle were valued at $1.50 per hundred below the Standard Corn Belt Ration steers, yet this big difference was offset to some extent by the economical gains of Lot VII.

5. The Commercial Feed Lot returning the next largest margin per steer was Corn Gluten Feed group, these returning $10.00 as contrasted with the best $10.49 Group III, Champion Molasses Feed.

6. The Commercial Feeds making the poorest showing were CJMCO Alfalfa-Molasses (Group IV), with a loss margin of $9.63 and Golden Rule Molasses Feed (Group VI) with a loss margin of $2.99. These two groups ranked low because of two fundamental reasons: They showed the highest cost of gain and a low selling value.

7. Our approximate figures, in 1918-19, show that it then took practically $19.00 per steer to cover interest, labor, bedding, housing, fencing, water, risk and miscellaneous expenses which, if one does not credit manure, should be deducted from the given margins per steer over feed cost. On the other hand, the manure credit at 5.6 tons per steer, manure valued at $3.75 a ton in that year in the field, totals $21.00.

The main lessons from these 1918-19 results are in a sense obvious, but it is well to emphasize some of them.

First, the greatest profit was made on the basis of pick-up being credited, and was secured in Group I, Standard Corn Belt Ration.

The next greatest profit was made in Group VII, the modified Standard Corn Belt Ration, wherein no corn grain was fed.

The Champion Molasses Feed ration comes third, (Group III), with the Douglas Corn Gluten Feed ration, Group II, close up.

Then in order came the Peters Alfal-Fat (Alfalfa-Molasses) Ration Group V,—Group VI, Golden Rule Molasses Feed Ration (with loss) and next the CJMCO Alfalfa-Molasses Feed Ration, Group IV, with also a loss.

The dressing percentages, based on Chicago selling weights are given herewith: Group I, 60.38 per cent; Group II, 58.43 per cent; Group III, 60.21 per cent; Group IV, 59.45 per cent; Group V, 60.59 per cent; Group VI, 60.51 per cent; Group VII, 57.76 per cent.

These dressing percentage figures show up in favor of Group V Steers, fed Peters Alfal-Fat (Alfalfa-Molasses Feed Ration) in that they ranked highest in dressing percentage, 60.59 per cent. Naturally, with a heavier shrinkage they would tend to dress higher. They showed the heaviest shrinkage enroute, and hence the largest dressing percentage. The next heaviest dressers were Group VI, Golden Rule Molasses Feed Ration, with 60.51 per cent, and then we have the Standard Cornbelt Ration, Group I. The poorest dressers were the "No-Grain" ration, these being Lots III (Champion), IV (CJMCO) and II (Corn Gluten Feed) in the order named. Lot VII was lowest with 57.76 per cent.

The actual selling values on the carcasses showed up in favor of the Standard Cornbelt Ration, Group I, they ranking first with price of 26.7 cents per pound on the cold carcasses. Next came the Golden Rule, with

26.20 cents; third and fourth, Peters Alfal-Fat and Douglas Corn Gluten Feed, with 26 cents; fifth, Champion Molasses Feed, 25.8 cents; sixth and seventh, CJMCO and the "No Corn Grain" Ration groups.

On the basis of these figures given us by Swift & Company, we note, therefore, that the best selling carcasses were in the heavy fed grain groups, and that the poorest selling ones receiving little or no grain, although the spread was less than 1½ cents per pound.

Figuring all of the slaughtering and other data together with the valuations as finally given us, we determined the relative packer values of these cattle on the basis of Ames net selling values. We found that the packer, in order to play even, necessarily had to pay more for some lots and less for some others.

Group I, brought $16.36 Ames, but were worth $16.10 to the packer. They sold for 26 cents too much.

Group II, brought $15.04 Ames, but were worth $15.23 to the packer. They sold for 19 cents too little.

Group III, brought $15.98 Ames, but were worth $15.31 to the packer. They sold for 67 cents too much.

Group IV, brought $14.82 Ames, and were worth $14.82 to the packer. They sold for just right.

Group V, brought $14.97 Ames, but were worth $15.27 to the packer. They sold for 30 cents too little.

Group VI, brought $15.01 Ames, but were worth $15.80 to the packer. They sold for 79 cents too little.

Group VII, brought $14.69 Ames, but were worth $14.50 to the packer. They sold for 19 cents too much.

All these figures are given on the per hundredweight basis.

Now we have refigured the steer profits on the assumption that the packer had paid the above figures, which enabled him to come out just even. On this basis the margin per steer over feed costs, crediting pick-up, was for Group I, Standard Cornbelt Ration, $14.94; Group II, Douglas Corn Gluten Feed Ration, $12.37; Group III, Champion Molasses Feed Ration, $1.83; Group IV, CJMCO Alfalfa-Molasses Feed Ration, $9.61 (loss); Group V, Peters Alfal-Fat (Alfalfa-Molasses) $11.70; Group VI, Golden Rule Molasses Feed Ration, $7.03; Group VII, "No Grain" Ration, $11.90.

In the last analysis, if the packer buyers pay just exactly what they are worth, then these should be relative margins credited to the different groups. On the basis of these figures, the Standard Cornbelt Ration ranks first, with Douglas Corn Gluten Feed second, the "No-Grain" Ration third; Peters Alfal-Fat fourth; Golden Rule fifth, Champion sixth, and CJMCO seventh or last.

THE RELATIVE VALUE OF THE MOLASSES FEEDS USED.

On the basis of Chicago selling valuations, one could have afforded to pay for each commercial feed per ton, and still make the same margin of profit as the Check Group I after crediting pick-up- the following prices:

Group II, Douglas Corn Gluten Feed, $14.10; but it cost $57.40 a ton.

Group III, Champion Molasses Feed, $27.48; but it cost $47.70.

Group IV, CJMCO Alf.-Mol. Feed —$60.36 (loss); but it cost $44.50.

Group V, Peters Alfal-Fat —$21.39 (less); but it cost $37.40.

Group VI, Golden Rule $0.51; but it cost $51.10.

The competition for the commercial feeds is pretty strong, particularly when they compete with a ration such as the Standard Cornbelt Ration.

It may be that a commercial feed would show up to much better advantage out in practice, where they compete against rations such as corn and timothy hay, or corn fodder and corn silage.

It may be, also, that the commercial feeds would show up to better advantage, particularly alfalfa-molasses feeds, if they used more oilmeal and fed more silage, and in general followed more closely the better practices of the Corn Belt.

It is always our aim to show up the facts in as clear-cut a manner as possible, so that our judgment concerning various rations used in the Corn Belt may be substantiated by actual figures, which represent the actual values received.

The chemical composition of the feeds used is given in Table XIII. This chemical composition table includes all of the main feeds used, even the tankage which was fed to the pigs following. It is well to note in studying this table that the molasses feed did not run quite so high in water this year, as in the previous year, altho the Champion ran better than 15 percent. The Alfal-fat better than 17 percent, the Golden Rule almost 17 percent in moisture and the CJMCO Molasses Feed ran almost 20 percent in water. The linseed oilmeal only ran a little over 8 percent in water, the oats a little over 8 percent, the alfalfa hay a little over 7 percent and the tankage a little over 6 percent.

For those who are interested in judging the degree of fatness of the steers as determined indirectly from the yield of the internal fat Table XIV is presented. This table also gives the weights of fats together with the percentage yield.

TABLE XIII.—CHEMICAL COMPOSITION OF FEEDS USED.

1918-19 Experiment.

	Chemical number.	Water.	Dry matter.	Crude protein.	Nitrogen free extract.	Crude fibre.	Fat or ether extract.	Ash.
Shelled corn	(775)	*23.76	76.25	7.88	62.95	2.26	1.99	1.17
14%		**14.00	86.00	8.89	71.00	2.55	2.24	1.32
Tankage	(652)	6.41	93.59	59.81	4.73	3.62	8.08	17.35
Whole oats	(766)	8.28	91.72	12.02	61.19	10.65	4.41	3.45
Corn gluten feed...	(768)	8.23	91.77	25.90	48.84	8.63	4.40	4.00
Linseed oilmeal ...	(769)	8.29	91.71	36.21	33.89	8.71	7.34	5.56
Champion molasses feed	(770)	15.51	84.49	11.49	47.49	15.69	2.63	7.19
CJMCO molasses feed	(771)	19.66	80.34	9.61	33.34	26.95	2.30	8.14
Alfalfat	(772)	17.36	82.64	10.77	30.28	30.54	2.02	9.03
Golden rule molasses feed	(773)	16.97	83.03	11.30	46.33	13.59	4.23	7.58
Alfalfa hay	(777)	7.01	92.99	13.27	34.11	35.58	2.26	7.77
Oat straw	(778)	5.98	94.02	2.74	40.69	42.62	.93	7.04
Corn silage	(763)	66.16	33.84	3.11	20.72	7.36	.95	1.69
	(764)	53.94	46.06	3.71	30.21	8.72	1.66	1.75

* As fed.
** Computed to, and charged in this experiment on this basis.

TABLE XIV.—THE HIDES AND FATS—WEIGHTS.

1918-19 Experiment.

Lot No.	No. of steers.	Selling wt. of steers (Chicago).	Hides.			Fats.					
						Caul.		Ruffle.		Gut fat. Estimate.	
			Total wt.	Av. wt.	Percent.	Wt.	percent.	Wt.	Percent.	Wt.	Percent.
I	5	6550	400	80.0	6.11	78	1.19	91	1.39	151	2.31
II	5	6170	387	77.4	6.27	63	1.02	92	1.49	167	2.71
III	5	6120	356	71.2	5.82	72	1.18	55	.90	145	2.37
IV	5	6000	375	75.0	6.25	79	1.32	56	.93	144	2.40
V	5	6100	374	74.8	6.13	56	.92	58	.95	147	2.41
VI	5	6020	378	75.6	6.28	70	1.16	63	1.05	163	2.71
VII	5	6350	324	64.8	5.10	70	1.10	55	.87	145	2.28

ANOTHER MOLASSES FEED TEST IN 1924-25.

In the year 1924-25 we conducted another experiment with Champion Molasses Feed. This feed was made by the Champion Milling and Grain Company, Clinton, Iowa, as they are now named, and was supplied to us for this test. This feed as fed in Lot X was fed in accordance with the instructions given us by letter and in person by representatives of this company. In this particular year the representatives of the Champion

Milling and Grain Company felt that it was not advisable to use linseed oilmeal in their ration altho they did keep the alfalfa hay in the ration.

Two of the groups in this particular experiment of 1924-25 which are of especial interest to us are the ones that are directly comparable, or namely Lot VI getting the Standard Corn Belt Alfalfa-Hay—Corn—Linseed—and Salt Ration, the Check Ration in the hay series, and Lot X which received the ration which was outlined by the Champion people.

The Allotment and Two of the Rations as fed to the Cattle in 1924-25 follows:

Lot VI—*Standard Corn Belt Alfalfa Hay Ration (Check)*—Shelled corn, mixed, majority yellow, hand full-fed twice daily; plus linseed oilmeal and one-half pounds per head daily fed in two equal feeds on the shelled corn; plus alfalfa hay hand full-fed twice daily plus block salt self-fed.

Lot X—*Molasses Feed, No Linseed Oilmeal Allowed.*—Shelled corn, mixed, majority yellow, hand fed twice daily plus Molasses Feed hand fed twice daily (generally speaking, aimed to feed 1 pound molasses feed to 2 pounds of corn); plus alfalfa hay hand full-fed twice daily (Corn somewhat limited first two months, but practically full-fed after that); plus block salt self-fed. This lot of cattle was fed in accordance with the frequent instructions given us by the Iowa Company making up this feed (Champion). This Champion Feed is manufactured by the Champion Milling and Grain Company, Clinton, Iowa.

The hogs following the cattle were fed limited shelled corn, a fifth of a pound of 60% protein tankage per head daily, and salt, self-fed. These hogs in the cattle lots were compared to a dry lot group of hogs, self-fed shelled corn, tankage, and salt in separate feeders in figuring the feed credits due to each lot of cattle because of the hogs following.

The work this year as in recent years was carried on in cooperation with the Corn Belt Meat Producers Association of which president A. Sykes of Ida Grove, Iowa, as Secretary, and H. A. Wallace, Editor of Wallaces' Farmer, Des Moines, Iowa, is Secretary. The Author was associated with Professors C. C. Culbertson, Q. W. Wallace, and W. E. Hammond in the prosecution of this experiment of 1924-25.

Many folks attending our Cattle Feeders' Hey days have suggested the further experimentation with molasses feed, Champion being suggested by some, in order to learn more about the possible profits to be secured from the use of a commercially mixed molasses feed made up mostly of cane molasses, usually over half, a considerable of molasses carrier, the ground and bolted screenings from flax and wheat, some cottonseed meal and other ingredients in minor quantities; this when it is fed as a partial substitute for corn, and as a complete substitute for the high protein linseed oilmeal, which we have found to be a profitable addition to our standard corn rations.

This experiment, 1924-25, throws further light on the molasses feed purchasing problem. In this year the substitution of the molasses feed as fed decreased the gains, increased the feed requirements for the hundred pounds of gain, and increased the cost of gains rather markedly. It is to be noted here that the use of the Molasses feed caused a marked reduction in amount of corn grain consumed per steer daily, and usually corn is, results considered, when well balanced, our cheapest fattening feed.

It is well to note, see Table XV, that the cattle fed Champion molasses feed were off feed to some extent for about eight days in the fourth month of feeding; very little trouble, however, was experienced with the standard corn belt fed group III in keeping them on feed. It is our opinion that the group (X) receiving Champion molasses feed would have done better had linseed oilmeal been included in their ration, but inasmuch as the manufacturer did not care to use linseed oilmeal with his lot of cattle, we carried these steers on as per his instructions.

The weights, gains, and feeding record together with the cost of gains and other pertinent data is given herewith in Table XV.

TABLE XV.—MOLASSES FEED (CHAMPION) VERSUS STANDARD CORN BELT RATION IN THE FATTENING TWO-YEAR-OLD STEERS.

(Nov. 13, 1924—Mar. 28, 1925.)

Seven 980-Pound Steers in a Lot—Five Hogs Following Figures on Single Average Steer Basis (Pounds and Dollars).

Group number	VI	X
	Alfalfa hay check.	Molasses feed.
Av. initial wt.	977.76	975.00
Av. final wt.	1378.57	1300.00
Av. daily gain	2.969	2.407
Initial cost per cwt.	8.08	8.08
Av. daily feed		
Shelled corn	21.123	14.101
Linseed oilmeal	1.500	.....
Molasses feed	.....	6.203
Alfalfa hay	7.395	8.737
Block salt	.025	.016
Feed required for cwt. gain		
Shelled corn	711.44	585.72
Linseed oilmeal	50.52	.....
Molasses feed	.....	257.65
Alfalfa hay	249.06	362.90
Block salt	.83	.67
Cost of feeds, cwt. gain		
Excluding hogs	18.44	20.91
Feed saved per cwt. gain on steers by hogs		
Shelled corn	28.64	46.12
Tankage	2.70	4.80
Net cost feed cwt. gains steers		
Crediting "pick-up"	17.76	19.80
Crediting hog gains @ $13.25	16.97	18.78
Necessary selling price steers per cwt. to break even, Ames		
Excluding hogs	11.09	11.29
Crediting "pick-up"	10.89	11.01
Crediting hog gains @ $13.25	10.66	10.75
Chicago selling price on steers per cwt. actual	11.60	11.25
Net selling value at Ames per cwt.	10.75	10.34
Margin per steer over feed cost		
Excluding hogs	—4.69 loss	—12.28 loss
Crediting "pick-up"	—1.96 loss	—8.67 loss
Crediting hog gains @ $13.25	1.21	—5.34 loss
Alfalfa hay, percentage refused	2.66	1.89

Feed prices: Shelled corn, $1.16 per bu., or $41.42 per ton (14% moisture basis); other feeds ton basis: linseed oilmeal, $48; molasses feed, $40; alfalfa hay, $20; block salt, $20. Initial cost feeder steers $8.08 per hundredweight Ames feed lot.

The selling, shipping and slaughter data are given herewith in Table XVI.

TABLE XVI.—MOLASSES FEED (CHAMPION) RATION VERSUS STANDARD CORN BELT RATION.

Selling, Shipping and Slaughter Data.

Lot No.	VI	X
	Alfalfa hay check lot.	Champion molasses feed.
Actual selling value Chicago, per cwt.	$11.60	$11.25
Shipping cost per cwt. (represents the difference between Chicago selling [shrunk] and Ames net [unshrunk] values per cwt.)	.85	.91
Selling price, net Ames, per cwt.	10.75	10.34

TABLE XVI—Concluded.

Lot No.	VI Alfalfa hay check lot.	N Champion molasses feed.
Shrinkage enroute (Ames to Chicago) Mar. 28,* 1925 to Mar. 30, 1925**		
Per head (pounds)	45.71	51.43
Percent	3.32	3.96
Dressing percentage, cold weights: Based on Chicago weights**	64.13	63.73

* Final group weight on loading day, single weight.
** Chicago group weight.

The relative value of the Champion Molasses Feed as used in this year's experiment is given in Table XVII which follows.

TABLE XVII.—RELATIVE VALUE OF THE CHAMPION MOLASSES FEED USED IN 1924-25 EXPERIMENT.

(Figured by comparing Champion Lot X of cattle with the Standard Corn Belt Lot VI to which it is directly comparable.)

What one could afford to pay for the various feeds and still make as much margin per steer as the check Lot VI to which compared. The check lot returned a margin of $—1.96 over and above feed costs after crediting pick-up but the molasses fed Lot X showed a still greater loss or $—8.67 on the same basis; here is a difference of $6.71 which represents how much must be taken off from the molasses feed cost as fed to the average steer.

The feeds used.	Lot VI*	Lot X*	or	Lot X*
Shelled corn	$1.16	$1.16		$0.96
Linseed oilmeal (ton)	$48.00	.....		.....
Molasses feed (ton)	.....	$23.99		$40.00
Alfalfa hay (ton)	$20.00	$20.00		$20.00
Block salt (ton)	$20.00	$20.00		$20.00

* In this test the corn in the standard corn belt ration lot (VI) was charged at $1.16 per bushel, but in the molasses feed lot (X) the corn, in order to have permitted the steers to bring the same margin as the standard corn belt fed group of steers, this over feed costs, would have had to have been bought at 96 cents per bushel; or, putting the matter differently, the molasses feed. champion, cost $40 per ton, but one could have afforded to pay oly $23.99 per ton for it if he would have reaped the same margin per steer over feed costs as experienced with the standard corn belt ration (Lot VI).

A word of explanation in regard to Table XVII is in order. The combination of prices as given for Lot Vl and-X at the bottom of this table are such as will insure, under the conditions of this experiment, that all of the steers in both groups, namely VI and X, return the same margin per steer over feed costs, or namely a loss of $1.96 per head in the case of Lot VI as well as in the case of Lot X. As the feeds were charged in the experiment proper Lot X returned a loss margin of $8.67 per head. This means then that oLt X showed a loss og $8.67 per steer as contrasted with a loss of only $1.96 per steer in Lot VI, when the feed prices used were as follows: shelled corn, $1.16 per bushel; linseed oilmeal, $48.00 per ton; Champion Molasses Feed, $40.00 per ton; alfalfa hay, $20.00 per ton; block salt, $20.00 per ton.

If, however, the shelled corn in Lot X had been bought for $0.96 a bushel then the results would have shown the same margin per steer, or namely only a loss of $1.96 rather than $8.67,—in other words the same as in Lot VI where the corn was charged at $1.16 per bushel. Figured another way, if Molasses Feed had been bought for $23.99 leaving the corn, linseed oilmeal, hay and block salt at the prices given then Lot X would have shown the same margin as Lot VI. Of course linseed oilmeal was not fed in Lot X but it was fed in Lot VI, and was charged at $48.00 in that lot. In this connection it may be well to mention that we feel that Molasses Feed, Cham-

pion, Tarkio, or other of a similar grade would show up better if linseed oilmeal was fed along with it. It appears however that such a suggestion on their part might interfere with their sales argument; anyhow such feeding is not recommended to the general purchaser. At any rate in this experiment Molasses feed cost $40.00 but it proved to be worth only $23.99 per ton.

The dressing percentage covering three years' results with Champion Molasses feed showed 61.7 as compared to 61.5 per cent with the Standard "Home Grown Ration" plus the good protein supplement, linseed oilmeal, a very close race. On the other hand the "Home Grown Ration" cattle shrank 55.3 pounds per head going to market, Ames to Chicago, a little over 300 miles, whereas the Champion Feed Fed cattle shrank more than 10 per cent more, or 62.2 pounds per steer.

In our work with molasses feeds we have made nine comparisons at the Iowa station, wherein six different makes or kinds of molasses feeds have been used, these in most instances having been fed according to the instructions given us by the molasses feed manufacturers. The molasses feeds have differed considerably in composition and quality, but in the main we have used straight alfalfa-molasses mixtures, as well as mixtures made up of ground screening, molasses, cottonseed meal, peat (sometimes included) and other ingredients.

INDIANA STATION RESULTS LIKEWISE UNFAVORABLE.

Our results are in accord with those secured at the Indiana Agricultural Experiment Station in that in no instance did the feeding of molasses feed, bought at current prices, prove a profitable venture when compared to standard corn belt rations made up of shelled corn, linseed or cottonseed meal, clover or alfalfa hay, corn silage, and salt, these ingredients being fed in economically favorable combinations.

In the two tests carried on at the Indiana station, some years ago, with Champion molasses feed it was shown that the standard Indiana ration, consisting almost entirely of home-grown feeds in both instances—two different years—gave much the better results.

It is our suggestion that if one uses a molasses feed such as Champion or Tarkio, that better results will be secured in the way of profits, or lessened losses, if some linseed oilmeal is included in the ration, so as to better balance up the corn and molasses feed, both of which feeds are "lacking in protein" from the steer fattening standpoint. Cottonseed, of course, may be used in place of linseed, although we prefer the first mentioned unless there is a rather wide devergence in price. However, for one who has plenty of corn available to be fed along with good leguminous hay, corn silage, oilmeal and salt, the liberal use of " 'screenings' molasses feeds" such as Champion, or Tarkio, or the Alfalfa-Molasses mixtures is economically warranted only when the molasses feed price is relatively quite low as compared to corn and oilmeal.

EFFICIENCY POINTERS.

After all to be successful in the cattle feeding business one must use the most efficient methods of feeding and management. The feeding game is hazardous enough even for those who are skilled in the buying, feeding and selling game.

In order to get the most out of the cattle feeding one must utilize the manure to proper advantage. The manure is a great asset and oftentimes represents all of the profit, if any, home grown corn belt feeds such as corn grain, corn silage, clover hay, alfalfa hay, whole soy beans (concentrate), and other similar feeds, should be depended upon if the maximum of profits are to be secured. Such feeds as these, however, need some balancing, and efficient supplements which may be economically secured under our present condition to feed along with these feeds consist of linseed oilmeal, cottonseed meal, home grown whole soy beans, and sometimes soy bean oilmeal. Linseed oilmeal we have found to be superior to cottonseed meal. Whether or not whole soy beans (seed) shall be grown is a question for the farmer to decide. The whole soybeans can be counted upon to be approximately as valuable as cottonseed meal. Soy bean oilmeal, on the other hand, is somewhat more valuable than the whole soy beans.

In the corn belt year in and year out there is no better concentrate than corn grain for the fattening of cattle, everything considered,—the efficiency of it, as well as the economy. To attempt to replace corn grain with molasses, cane or beet, or molasses feeds are used in very small quantities, and are bought at a price certainly not greater than that of corn.

Molasses feeds that carry some 50 per cent or so of molasses together with a liberal quantity of wheat screenings, neither of which are equal to corn when fed in quantities of any liberality, should not be expected to be equal to the good farm grown corn in feeding value when said corn is properly balanced by leguminous hay and sufficient of the best protein concentrates.

The superior cattle roughages are the leguminous hays such as red clover and alfalfa, together with corn silage. We must remember, however, that corn silage is not an efficient cattle feed unless it is properly balanced with such superior balancing feeds as linseed oilmeal or cottonseed meal, or a happy combination of the two, or some of the other concentrates which we have heretofore talked about. It must be remembered also that when corn silage is used that a dry roughage may well be allowed such as a small amount of oat straw or better still a leguminous hay. If the cattle have all of the corn silage they want twice daily they will eat very little of these dry roughages, say not more than one-tenth of fifteen of the total roughage consumption.

Timothy hay on the other hand is a very poor roughage and should not be used for the fattening of cattle that are to be made prime; it fits in better for the stocking of cattle or for the carrying of horses. Mixed hay is valuable in proportion to the amount of leguminous hay which it contains. The more timothy in it the less valuable it is.

MINERALS, FEEDING PAID.

Our work with mineral feeding in the fattening of steers has shown that a mineral mixture was profitably fed with a ration consisting of shelled corn, corn silage, linseed oilmeal, alfalfa hay and salt. A good mixture of minerals, which we have found to be acceptable, is made up of limestone 50 pounds, a bone product, preferable spent bone black 50 pounds; total 100 pounds. To each 100 pounds of this mixture add from ½ to 1 ounce of potassium iodide, and mix thoroughly. Two year old steers in our experience can handle one to two ounces of this mixture per head per day to advantage. We would suggest the allowance of one ounce for yearlings, and from one-half to two-thirds of an ounce for calves. We have found that the mixture may be well fed upon the corn silage or even upon the grain.

WHAT ABOUT OATS?

The use of a small amount of oats in the getting of cattle on feed is considered good practice, but the continuance of the oats in the ration after the first month or so has been found to be inadvisable under our experimental conditions. Our work was done with whole oats which is the preparation usually used, because grinding is not being resorted to on the average farm for beef cattle. Oats seem to have a somewhat higher value for calves than they do for older cattle, but even at that they do not have a value anywhere near equal to that of corn in the carrying of calves. Of course, the heavier the oats the more valuable they are pound for pound, hence oats weighing 40 pounds to the bushel, as they do up in Canada, are much more valuable than oats weighing 29 or 30 pounds are often found in the poor oats section of the Southern United States. When we realize that Iowa and Illinois oats carry about 25 per cent of hull, and that this hull is not any more valuable than oat straw, we can readily perceive that the other 75 per cent, the meat of the whole grain (the kernel or groat), which is about the same in feeding value as good sound corn cannot possibly make the oats on the whole show up to be as valuable as our good old Indian corn. The oats hull represents too much wastage.

BRIEF EPITOME OF CATTLE FEEDING ESSENTIALS.

Now that our time is about up, and our space in the Year Book about exhausted, we think it entirely appropriate that we close this revised paper with a few paragraphs that we wrote some years ago, and which are still as orthodox and as true as ever: *It is well for the cattle feeder, old and new to always bear in mind that the steer finishing business to be made economically successful is a very complicated process, and requires much skill in (a) purchasing or producing feeders, (2) shipping and handling preparatory to final feeding to marketable finish, (c) selecting and utilizing the proper feeds such as silage, hay and grains both of basla and of supplemental nature, (d) proper manipulation of the feeds during the feeding period as in relation to amounts of grain, supplements, silage and hay used, (e) determining the length of the feeding period most opportune under the local conditions, (f) carrying to the most profitable weights and finish, because in some years heavy, fat cattle are relatively high and vice versa, (g) and in shipping and marketing to best advantage.*

The cattle feeder to be most successful must ever and anon keep studying his conditions and most of all keep changing his methods to best meet the new, different, but constantly appearing conditions that alter the situation continuously.

What is good practice today may be bad tomorrow; watch the crowd but don't necessarily follow.

PRESIDENT ALLEN: Now we have with us, ladies and gentlemen, the President of the Federal Land Bank of St. Louis, Mr. Bestor, and he will talk a little while to you on the agricultural outlook.

AGRICULTURAL OUTLOOK.

H. Paul Bestor, *Federal Land Bank, St. Louis.*

Mr. President, Delegates to the Illinois Farmers' Institute, Ladies and Gentlemen: It is a great pleasure to talk to you again, to see you with more cheerful faces than I think I have seen in any audience in Illinois in late years. You know, during the last few years it looked as though the farmer would have as perpetual a frown on his face as has the citizen of New York City. Most of us felt about as mournful as if we had just finished reading a story in Scribner's, but things have changed and we are feeling more happy, more prosperous and more optimistic for the future. And, it is right and just that we should. It is right that you should, especially living in such a wonderful fertile country as the central section of Illinois, those of you who are fortunate enough to farm here.

During the last few years there were plenty of men who wanted to tell us this and that as to the causes for our troubles and they told us all about hard times, whether they knew anything about it or not, and there were a great many of them who had panaceas for all of the farmers' diseases, and so at the present time there are also a great many people who want to tell us how we may be prosperous and they want to tell us how prosperous we are going to be, and they want to tell us that we are here in a period of prosperity, and that everlasting happiness stands in front of us. Well, I believe it does to a certain extent. I believe we are entering into a period of prosperity. Everything indicates at the present time that fertile land will become more valuable, that land of low fertility will be less valuable, that the thousands and thousands of acres of marginal land which went into cultivation during the war will go back to non-cultivation, or else there will be a readjustment where some of the land may have to be used for other purposes. This is intensified, perhaps, by the tax situation.

From our viewpoint, the most sinister phrase in the present note of prosperity is the taxation note. You men no doubt have watched taxes increase in the last few years fifty, seventy-five, one, two and three hundred per cent in many instances. As I see it, this is the most serious menace to the prosperity of the future, and as far as I can tell, unless there is something done about it, it is only a question of a short length of time when the

individual ownership of farm lands will be impossible. We hope that that time will never come, however; other things may operate against it.

TYPE OF CREDIT NEEDED IN FARMING.

Now, I have only a few minutes, and I am going to cut out all of my speech but one phase, and that is a phase which you will probably soon tire of hearing; that is the phase of the credit of the farmer and the type of credit which is suitable to him. We all know and it is generally conceded that there has been an abundance of credit given in the last few years, but I think you will agree with me that the great trouble with the credit was given to the farmer was that it was never suited to meet the needs of the farmer's particular business.

I want to speak particularly about the method of making loans on farms. You probably have heard that first mortgages now on American farms range from ten to twelve billion dollars. The sum is staggering, and the interest charge against the American farmer for that purpose is almost beyond belief. Now, the time has come when it has been demonstrated beyond the peradventure of a doubt that the old type of loan,—and you will pardon me for making the statement,—on farm land, a loan of from five to ten years, is inadequate, obsolete and has no business on the present, modern day farm. The amortized loan which was adopted one hundred and fifty years ago in Europe which was adopted in this country through the Federal Farm Loan Act eight years ago, has proven absolutely that it is the type of loan that suits the farmers' needs. Now, I don't care whether you have made a loan through a joint stock bank, a Federal land bank or anything else, but if the man who recognizes the fact that the amortized loan is the only loan for the farmers' needs, should study the conditions of making loans. There is no other business in the world operated on the system of slow returns that would make the type of loan that the farmer makes. Borrowing money, of course, is a proper business where it can be obtained advantageously and to good results. Every institution believes in borrowing money where they can see it pay its way back.

SHORT TIME LOANS INADEQUATE.

Now, gentlemen, placing a five or a ten year loan on a farm is a crime. It is a crime because the man who borrows that money does not have the least idea of what conditions will be when that loan comes due. He does not know whether interest rates are going to be high or low, or even available or whether his equity in the farm is going to enable him to finance a new loan. You may say that five per cent money is always available in Illinois. It was not four years ago that hardly any money was available. It looks like we are headed for prosperous times now, but we don't know what the situation will be ten years from now.

I had an example yesterday where a man who purchased a farm in 1920 for $30,000 paid $10,000 down and made a mortgage for five years to an old loan company, and the loan is now due and he has to borrow the money. There is no reason why that system should have been used in the first place. Now, he didn't make any money and his loan is due. Where can he get the money? He can't get it from the land bank because he has not much of an equity left; he can't get it any place. In most instances that man is going to lose what little money he saved during his lifetime, because he didn't have a loan that suited his needs. I stand flat footed on the proposition that no man has a right to jeopardize himself and family by making that kind of a mortgage. Since the organization of the amortized loan the Federal Farm Loan banks have loaned to the American farmer $1,500,000,000, and it is my opinion that had this loan been in effect in 1919 and 1920 that from the farmers' standpoint the situation would not have been nearly so severe as it was. It would not have solved all the problems, of course, but it would have saved hundreds of thousands of dollars and would have tided them over this period of depression.

An amortized loan precludes the necessity of any refinancing possibility. That very thing has lost many farms. One of the reasons for the birth of

the Federal Farm Loan system was to absorb the shocks in time of depression, and it has at the present time for farmers who have heavy loans on their farms. As to the stability of the twelve Federal banks, they all stand back of their bonds and they have over $45,000,000 in liquid assets, and not one penny of their resources was touched because of loss. The Federal land bank of St. Louis is an institution of $79,000,000 and operates in every county in the State of Illinois. I am not here boosting the bank, but I am here boosting the amortized loan, because I think it is high time we adopted it.

Just a day or two ago one of these examples came to my attention. A widow called me up one afternoon not long ago on long distance and she told me that her husband died not long before and left her and the children with a farm and she found out that there was a five year loan on the farm that was due. He paid a high price for it in 1920, and she wanted to know where she could get a loan. We couldn't make her a loan; the estate was in such shape we couldn't make it anyway. You see, from that one standpoint alone, unless you are well fixed, so you won't have to worry, you can not afford to take a loan that will come due after you die. An amortized loan is never due; it pays itself off. All your family has to do is to keep the payments up. I don't believe that the average farmer knows what the condition of affairs is and what the difference in loans is, or he would not stand for the other loan.

Some of you men may say you can get loans a little cheaper from the other fellow. That may be true. You may get a loan at five, but the Federal Land Bank has to charge five and a half, because in order to get the money it has to float bonds, and you have to pay high interest on long term money. However, in the long run the amortized loan is cheaper at five and a half than your five per cent loan.

Maybe you think I am talking too much about this, but I believe that one of the best things possible for the farmer who has to make a loan is to make a loan knowing that you will not have to refinance it. Now, I think you will agree with me that there comes a time when everybody has to borrow some money, and you men have to go to your local bankers and see them, and you know how nice you have totalk to the banker. You have to talk to him very nearly as nicely as Rastus did when he was brought up before Judge Nelson in Memphis. The judge said to Rastus, "Rastus, you are charged with beating up your wife." "Yes, sir; I reckon I done it; nobody else did." "Well," said the judge, "Tell me how it happened." Rastus said, "It was just this here way. I come home on Saturday night and Mandy didn't have no supper for me, and I says, 'Mandy, where is my supper?' She says, 'You go along nigger, you get your own supper.'" "Well," said the judge, "You hit her then, did you?" "No, sir," said Rastus, "I didn't hit her then. I reached down in my pocket and I gave her a four-bit piece to buy me some supper, and you know, Judge, that girl took that four bits and went out and got a drink." "Well," said the judge, "did you hit her then?" "No, sir," said Rastus, "I didn't hit her then. I says, 'Look here girl, if you don't stop swearing at me and go and get my supper, I am going to take you before Judge Nelson.' She said, 'What was that you said? You mean you all is going to take me before that worthless no count Judge Nelson.' Well, that is when I hit her, Judge." [Laughter.]

If we all knew the right thing to do we probably could get the money from the banker, but the banks are not themselves in a good position. How many second mortgages do they own and how many farms do they own. Now, all those loans should have been amortized loans.

INTERMEDIATE CREDIT BANKS.

There is another thing: In 1923 Congress passed an act called the Agricultural Credit Act, and in that they organized what is known as Intermediate Credit Banks. Those twelve intermediate banks are organized for the purpose of furnishing what the name indicates, intermediate credit, to the farmers. These twelve banks have a loan capacity of $600,000,000. As a general thing they are supposed to assist in co-operative marketing.

Recently I was present in Washington at a session of the President's Agricultural Commission and the matter was brought up that the farmers generally did not know much about the bank and at the suggestion of the chairman we told them we would try to tell the farmers what the banks were for. They have not been utilized much in Illinois. The officers of the Federal Land Bank in St. Louis are the officers of this bank. During the first year we advanced five or six million dollars to the farmers.

They function in three ways: first, in making advances to co-operative associations on warehouse receipts, on staple commodities, the rate last fall being 4 per cent to the associations. Another way in which they operate is by discounting farmers' notes, with a maturity of from six months to nine months for country banks, or for agricultural credit associations. Now, an agricultural credit corporation is rather a new thing. However, it may be a live stock company, a loan company or any other co-operative marketing agency. They can start out with a capital of $10,000 and discount seven times their capital with the Intermediate Credit Bank. There are about eight or ten in Illinois now. The other way they operate is by Productive Credit Corporations.

You men in this great organization have worked out a lot of things and are now working out a lot of things which help to make permanent prosperity; the same thing is true of other organizations. The colleges and the agricultural department have done wonderful work in the last ten years in assisting to solve many of the problems. As I said, one of the paramount things that the bank is called upon to solve is the protective credit problem. We tried an experiment last year accepting ordinary chattel mortgages as additional collateral, and we loaned some million to a million and a half dollars, but strange to relate, we got it all back. Nobody was quite so surprised as we were. We did not want to loan that money; we did not want to enter that kind of business. We thought that was the craziest thing we ever heard of, but we attempted it. We were as careful as we could and the men who had charge of these credit corporations were careful, and we loaned that money at five per cent and got away with it very nicely.

I don't think the problem is solved, however. I do think this, that the solution of the proposition of protective credit can be accomplished so that the farmer can use what collateral he has to the best advantage, so he can work his collateral, so that he can get some funds and so that the work he is doing in the field will amount to something, whether through crop insurance or not. I believe it is one of the things which is going to help to make permanent our future.

I don't want you to think I am pessimistic because I mentioned taxes a while ago. I have every confidence in the present as well as in the future outlook, and I believe we are going to have prosperity. I don't want to see waves of depression and then prosperity, but prosperity all the time, and I don't think there is any question but what the greatest prosperity of all will be in the country where you have the fertile soil, where the fertility is kept up and where it is natural fertility.

In closing let me say that I want to thank you for this opportunity to talk to you, and if any of you are interested in the question of farm credit as we are handling it in the Sixth District, I will be very glad to help you. I thank you.

PRESIDENT ALLEN: Before adjourning, please let me announce that cars have been provided for those who care to tour the city and you will find them waiting for you outside the door.

We will now adjourn until 7:30 o'clock this evening.

Whereupon a recess was taken until 7:30 P. M., February 19, 1925.

THURSDAY EVENING SESSION.

February 19, 1925, 7:30 o'Clock P. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: We will begin our program with a Reading by Miss Olive Mapes.

Reading.....Miss Olive Mapes
Men's Chorus.....Orchestra Accompaniment

PRESIDENT ALLEN: Now, ladies and gentlemen, I take pleasure in introducing to you Mrs. S. E. Bradt, who will introduce the speaker.

MRS. BRADT: LADIES AND GENTLEMEN: I attended the State Convention of the Women's Clubs of Illinois last year, and I fell in love with one of the speakers there, the one who talked about Art in its Relation to the Nation, and when I came home I told the family about her and why I fell in love with her, and I am going to tell you too. I said "She has a mind like a man" and that was as high a compliment as I could pay her. When we were planning our program this year we found that Dr. Rowena Morse Mann, who has been living in the east a large part of the time was going to be in Chicago this month and she kindly consented to speak for us, and so we are very happy to have her with us tonight.

THE NATION'S OUTLOOK.

DR. ROWENA MORSE MANN, *New York City.*

MY DEAR FRIENDS: "Where are we going" is the very question that was put to me by the director of this program. If we are to find where we are going in America and in our American civilization, it might be wise to find out where we have come from and a little about what has happened along the way and where we are today. There are interesting developments in our country, which if you will allow me, I will survey here, inadequate as such a survey must be.

Dr. Rowena Morse Mann.

Let us take an inventory. Since the days of Darwin, University men and scientists outside of academic walls have gradually advanced the cause of knowledge, until today one of the fundamental sanctions of common men is thoroughly undermined. Few men now fear the anathemas of the clergy about the awful punishment in the life to come. The clergy that for a thousand years spoke with authority is losing its hold upon men. There has been no successor to Henry Ward Beecher, much as the country has needed another Beecher. The churches are agencies now of social betterment. They do not appeal to men strongly on the "after life." The preacher is a professional man like other professional men. He leads because of his character and the wisdom of his social methods. Science has robbed him of the divinity that once hedged him about. Science has taken away the mystery that once ruled so large a proportion of men. Millions of people have ceased to feel one of the great sanctions. Having taken away so great a means of stabilizing society, does it not concern University men and scientists to return an equivalent?

Of similar import is the fact that during the three generations since William Lloyd Garrison's great agitation, the *State* has pretty nearly lost its grip upon society. In order to arouse men to the necessity of destroying the great economic wrong of slavery, the State was brought more and more

into disrepute. The State had permitted itself to become the shield of slavery. The Nation was likewise suffering from the same dangerous alliance with a great social wrong. But as the Nation finally broke the hold of slavery upon its leaders, the Nation came out of the agitation with high moral prestige. Lincoln's work and death democratized and hallowed the Nation.

Even if Garrison had not lived, the effect of two or three firmly lodged preconceptions of our life would have brought the State to its ultimate weakness. The delicate balancing of powers among three departments of all our state governments has the effect of undermining all sense of responsibility on the part of officers of the State. A governor may "pass the buck" as we irreverently say. The legislature, in deference to the supposed views of its constituencies, may likewise shirk responsibility. And the courts may, and do, avoid responsibility. The Fathers of the American democracy were so disgusted with the results of corrupt personal leadership in eighteenth-century Britain, that they went to the opposite extreme of trying to set up a system of laws instead of a system of responsible men. But laws do not operate automatically. One might cite scores of instances to prove that the most important laws ever enacted in the United States had not been enforced. The effect of non-enforcement was fatal to the cause sought, for example, the failure to enforce the Sherman Anti-trust law.

We now begin to see that the elaborate division of powers and careful distribution of authority is failing, failing above all in the old States that once held so complete a sway over the emotions and lives of men. In the old Eastern States the failure to enforce prohibition is daily weakening the States. There must be some person, some leader who both knows what modern life requires and who will take responsibility for acting, even against the apparent will of the majority. Such men have not been trained in the Universities. The law schools set up legal practitioners, men who can "find themselves" in the maze of intricacies that now dominate the legal profession. Machine politics does not train such leaders, for the masters of political organizations seek ever to know how best to combine race groups in the great cities or appeal to old prejudices in the country. Their aim is to keep their crowd in office and incidentally to make fortunes out of "the game." The distribution of powers has weakened the State; the failure of higher education and the failure of party politics have still further hastened the decay of the State.

Society can not long endure a process of undermining the very sanctions upon which organized society rests. That is exactly what our system has been subjected to since the Jackson epoch. But there is yet another aspect of the process. During the constitutional period, Americans set up the practice of requiring every representative to be a citizen of the district for which he spoke and voted in representative assemblies. This appeared to be democratic at the time. It was intended to thwart the control of legislation by groups of powerful men who might set up candidates for as many districts as they could finance in an election; people feared powerful economic groups and sought to democratize representation. The outcome has been to enable small minorities in the constituencies to control the representatives of great masses of men who can not make a business politics. The representative pays heed ever to his district. He will rob the Nation as a whole in order to enrich his constituents. He has lost character as a man; he has failed as a legislator; there is no incentive for him to study. Such a representative is the natural subject of a boss; he is in part the cause of the political machine. *Nothing, in my judgment, has more weakened the fibre of our State and National legislatures than just this fact. It is a calamity.*

I have indicated two very serious developments of the last three generations of American history, the break down of the sanction of the clergy, the church, the absence of all fear of the penalties of the life to come; and the break-down of the morale of the State, its social and its political inhibitions. Men no longer fear God nor tremble in the presence of the State. The preacher is just a man; the governor and the local judge are mere poli-

ticians. Reverence has gone. In part this was inevitable. When science discovers truth and lays the foundation of vast social betterment, all men must be grateful, even if it undermines the faith of the masses. In so far as this state of things is due to misconceptions of the proper methods of democracy, it has not been necessary. When men find that their political conceptions have failed, it is the business of education, both in institutions and in political organization to abandon false and set up better methods. Democracy can not long function when its leadership fails. The elaborate machine system is a legation of responsible leadership. *It is a truism in our life that leadership has been failing with us now for thirty or forty years.* Where both religious and political guidance fails, revolutions breed. There is no help for it. France and Russia are the outstanding examples. Shall the United States invite such a catastrophe? That is the query, I have hoped to have everyone present this evening contemplate.

TRAINING FOR CITIZENSHIP.

If the American Nation is to escape, there must be training for citizenship of young men and women. We attempt to train them in Universities but three-fourths of our divinity students realize their dilemma. Somehow they do not find a way forward. Three-fourths of our law school students feel the hopelessness of the political situation, but they are not trained to be physicians to society. The vast majority of our undergraduates care more for a grandstand football exhibition than they do for the fortunes of either State of Nation. Yet the Universities and the Colleges receive hundreds of millions annually for the very purpose of training leaders for society. It is the failure of both higher and more general education today that gives more occasion for uneasiness on the part of thoughtful men than any other thing. With American society surely drifting into disorder, with politics stalled and deadlocked, there is no generation of enthusiastic young men and women to help us to a sane reform. The national situation is distressing, public opinion is chaotic; and every economic group is seeking to help itself at the cost of us all. Under such pressure the poor security the bosses give must soon fail.

Besides, the Nation embraces elements of strength and weakness hardly imagined by most people generally counted well informed. In order to exploit the national resources more rapidly, our fathers imported European labor in unprecedented numbers. Unlike earlier immigrants, the later ones settled in the cities. Their labor enabled American industry to become the greatest industry in the world. But slowly and surely the hordes of immigrants came to feel hostile toward their employers and sometimes the industry itself. Then another element became involved. The sons of farmers hastened to the growing cities. In order to better their lots and compete with "foreigners" they organized into vast unions. These unions soon came to think that their interests took precedence over all other interests. And Labor, as it is called today, confronts employers with their cast numbers and demands what it can get. The result is great blocks of unassimilated population and far flung organizations of workers, while for themselves and against "foreigners" and "labor" the owners of capital are also organized.

Nobody is for the public. At one time the country sought immigrants from all lands. It was only sufficient to be poor and helpless. America was the asylum of the oppressed for a hundred years. Now business men wish fresh supplies of labor, but they fear the ideas that new laborers may bring with them. Now Labor unions bitterly oppose the importation of fresh supplies of labor, lest their employers prove too strong for them. They wish no new competitors in the field of their activities. And the Nation flounders. Loath to close its doors so long wide open, it is also loath to take in "anarchists." Suddenly the democracy has grown afraid. Fear is a terrible master.

The combination of industrial enterprise, vast resources and the labor of a new and active population has give us an industrial power unmatched in all the world. The industrial output in 1920 was something like seventy billions worth of goods. That is a greater wealth than the world has ever

known. The total property of Germany or France is hardly worth more than American industry creates in a single year. But the very existence of this vast wealth constitutes one of the greatest problems of all history. It might not have been a problem, if the plants of industry had originally been scattered all over the country, at waterfalls, near coal mines, wherever railroads could best be focused for general social purposes. But the people were not aware of the need of any such distribution until it was too late to distribute its social power. Business built the system to suit their immediate not their ultimate needs.

The consequence is that we have built vast cities, built Parises, Berlins and Londons, with all the risks, injustices and unavoidable hardships of life in a great city. Our legislators knew that Paris was the storm centre of Europe, that the millions of poor people gathered there had long been the pawns in revolutions. They knew that Bismarck had built a similar storm centre in Germany, with his Hohenzollerns, his Prussian absentee junkers, his snobbish prussion army officers and his newly rich industrial masters. Perhaps they did not know that this was one of the greatest opportunities, if not causes, of the great war. But it was a fundamental cause. With so much of fatal statesmanship before them, American lawmakers and American business men reared their New Yorks and their Chicagos at places most convenient for them.

CONDITIONS LEAD TO UNREST—NOT REMEDY.

Nearly all the *industrial wealth* of the Nation is concentrated in a narrow belt of city-covered land stretching from Boston to Minneapolis. So concentrated is this wealth that New York alone pays more income tax to the Federal treasury than do all the states of the South. This fact is of itself a sore problem. The poorest and the richest of the country are brought into close juxtaposition. The rich speak one tongue, the poor, in general, speak another. The rich have little enough wisdom to make vulgar display; the poor are so miserable they can not avoid display. These displays and these contrasts are ever exaggerated. When there is work enough for all, laboring men urge strikes; when there is too little work, employers resort to lock-outs, in the hope of saving high costs of production. In summer working folk sometimes seem to be the happiest and the most reckless of men, the "happiest mortals on earth", as some men would have us believe. In winter long lines of hungry proletarians stand shivering in the cold waiting their turns at the coffee counter and this is free America.

In the presence of these contrasts and without thought of danger, the railroads and builders of industry go on concentrating their vast plants, their huge banks and their commercial exchanges. The greater part of the real power of the country is thus placed within the easy reach of masses of men who must, in the nature of things, one day be unemployed and starving. Unemployed and starving men can not be expected long to remain passive. There is but a short turn between starvation and revolution. In neither case does the worker, without work, stand to lose. He can not make his case much worse; it may be that he can improve it. A leader among labor groups said at a dinner recently, "the railroad terminals and the banks of a great city could be seized without the loss of twenty men". This may or it may not be a correct judgment. The fact that working people think such a thing possible ought to set men to thinking.

And outside the cities, there are the farmers. For half a century, they have been declining in relative, and even actual, strength. Today they are the minority of the Nation. They grow the wheat of the country at a loss. The workers of the city eat bread at war prices. The farmer who owns his home has to sell it to pay taxes; the tenant who ought ever to plan to buy a home does not think of buying. The former owner of land is becoming a tenant. The tenant is becoming a day laborer. Vast tracts of farm land are falling into the hands of city-dwellers who have been able to gather from industry or trade the means to buy lands. Men who have stakes in the country decline in number every year. It is plainly a repetition of the awful evolution and that took place in Italy during the second and third centuries before Christ. This appears a very pessimistic view. Let the

optimist read the figures of the last census. There he will find the cause of agrarian unrest.

But unrest does not usually bring remedies. The unrest of 1890 was great and ominous. It brought no solution. The lucky turn in the economic world saved the day for a time and later the great war set up a feverish prosperity only to plunge the farmer folk into still deeper despair. The old free farmer of the United States is disappearing; and thinking men seem not to concern themselves. Might not thoughtful men and women who care for our Nation seek to lend aid? Is it our business to remain contented with the policy of drift till all of us are pushed over the precipice?

And, in the face of the city danger and the menace from the land, men talk of disfranchisement. There is growing feeling on the part of powerful men, especially among industrial leaders that democracy is a failure. Very many of these leaders seek openly to disfranchise the city majorities, their own laborers, in the hope of retaining control of the national economic life. And such men think to unite country folk against city workers and thus retain their power undisturbed. A great American statesman once warned the country that the coming of great cities would be the end of American democracy. Our leaders, ignoring that warning, now seek to avoid the consequences by disfranchising great masses of people. It is proposed under the form of constitutional arrangements. Men's faith in constitutions is to be subjected to still another strain by giving city majorities minority representation in legislatures. And the plan, already in operation in Massachusetts, New York, Rhode Island and Pennsylvania, is to be made effective by appeal to the age-old dislike of country folk for city folk. Is this wisdom? Is it not an appeal to disaster?

May we not draw a lesson from our own history? From 1776 to 1861, the leaders for reactionary ideals in Virginia and the two Carolinas played this dangerous game. It was known to all that the masses of commonfolk in all these states were opposed to slavery and that, if they were allowed fair representation according to any democratic method, they would surely abolish the "institution". In each of these states the owners of property, in the main slave property, were able to prevent the people from getting a majority in any of the legislatures. In the greatest struggle that ever took place about the matter, John Marshall, who was the great nationalist, did his utmost to prevent the white, non-slaveholding people of his state from gaining the power to destroy slavery. He thus made strong the power that was soon to disrupt the very nation he was saving. But year in and year out, the old South kept its masses of plain people from seeking that reform of property relations which alone would have prevented the civil war. The ablest men the country ever produced thus thwarted democracy. They were setting the stage for their own ruin, the ruin, too, of countless innocent folk who never gave themselves the trouble to inform themselves what was happening. Was there ever greater blunder? The worst way to solve the slavery problem, civil war, was forced upon the country by men who sought to save their property by thwarting the will of the majority. We may not all have faith in majorities, but surely we shall never find consolation in the conduct of the minorities that have from time to time been able to bring upon the country such disaster as that which marked the terrible years that followed 1861.

And, strange, as it may seem the universities and colleges of the Old South, without exception espoused the cause of those leaders who would rule against the wishes of the majority. In 1819 the University of Virginia was founded in the hope that it would train young men to deal wisely with slavery. In fact Jefferson left a plan to Virginia whereby slavery was to be abolished slowly and with least harm. His grandson urged it upon the legislature. Within ten years both the young university and the legislative leaders of the people abandoned the ideal and the hope of Virginia's greatest statesman. The University of Virginia became the very centre of pro-slavery teaching. What influence it exerted, and it was great, was exerted on behalf of what all men have now come to regard as a grievous economic and political wrong. Not even the persuasive powers of Jefferson nor the wisdom of a great school which he set up prevailed against those leaders who were bent upon safe-guarding property at all risks.

What must be said of the University of Virginia must also be said of the famous University of South Carolina, an institution whose trustees made the unique record of dismissing a president because he did not change his opinions. Thomas Cooper was engaged there as president in 1820. He was the first, I believe, in the United States to teach that the Old Testament was not an inspired book. He was known to entertain that view in the beginning. He did not change his view. In 1833 he was dismissed because he still taught the same thing he began with. Strange as it may seem, Cooper had been an anti-slavery man in the North. In South Carolina he became an ardent protagonist of slavery. For this change he was not dismissed. In Virginia, in South Carolina, in Alabama, everywhere in the old South, the universities set up by the State taught that the owners of property should govern society, even when they must deny democracy to do so. In the denominational colleges, there was the same trend. Heads of divinity schools declared in favor of the divine right of slave owners to hold their property as against all opposition. And, when by chance, teachers or preachers warned people against the prevailing dogma, they were, without exception, dismissed. The South, in the heyday of its greatness, gave the Nation an example of what it means to suppress majorities.

Having concentrated their wealth in the form of workers and plantations (these plantations forming a narrow belt that extended from Petersburg, Virginia, to New Orleans) the planters were so situated that they could control States and their whole social system; and the South's delegation in the national congress were likewise, almost without exception, owners of slaves and plantations in the so-called black belt. It was a marvelous civilization; Southerners made remarkable leaders of men; they were classical scholars and profound students of the science of government. *But their fear of the majority of common men was their everlasting undoing.*

THE FEAR OF DEMOCRACY.

Shall the Nation again make the mistake of fearing democracy? We are in a position to do so. Our vast cities are filled with workers whom many of us fear; and our workers are more and more coming to dislike, even hate, their employers. The Nation has accumulated its greatest wealth in these cities where it may easily become the object of violent strife. Here are two reasons that men should begin to take heed. Already several of the industrial states have set up constitutions that limit the power of the majority. Manhood suffrage prevails to be sure but the fruits of manhood suffrage are denied. Our industrial states are free in outward form from industrial control, but in fact industrial control is apparent every day. What avails democracy if schemes and methods of popular restraint become the rule of life? It is a mistake we have begun to make. Let us all, especially great business men who fear and distrust the people, cast ourselves upon the ocean of public opinion; we shall be surprised how well we swim.

Aside from the difficulties and the anxieties of the domestic situtation, the foreign relations of the country are such that we are apt to have our electorates confused and so intensify our problem, both from the point of view of democracy and from the point of view of national safety. In 1914 the Nation and its citizens owed the rest of the world a sum so great that the interest has generally been estimated at five hundred millions a year. Before the great war was half over all that indebtedness was paid in goods at war prices. Now, four years after the war ended, the Nation and its citizens have loaned other peoples enough capital to yield a billion dollars a year. The people and the Nation are thus the greatest creditor in the world and the sum already loaned is increasing at the rate of a billion a year. That is a fearful fact. It is a reversal of role so sudden and so vast in its consequences that common folk have not become aware of the new state of things. They clamor for the payment of the interest and capital by Europeans who are too poor to feed their children. They demand payment in some cases as a matter of punishing hereditary enemies, for example, the Irish and German attitudes toward the English and French debts.

There was another great change of roles that came out of the war and the peace which followed. Hitherto, the Nation had never been concerned greatly with international security. The people had never known what international fear meant. The war came; it taught them the meaning of Europe and the significance of war on a world scale. For a time all good Americans felt the imminent danger of German victory. At the peace, the United States was left secure. Few men were left with any sense of fear of any nation whatsoever. The great German militarist plan had shown what could be done by that country. When Germany collapsed, there was no longer any power the United States feared. France, with its stationary population could never attack the United States. England, dependent for its food and raw materials upon ocean traffic, could never make aggressive war upon the country. In fact England has not in a century made aggressive war among nations. A trading people is by nature pacific. Germany being subdued, there was security. That was a great gain. The people feel secure; they do not recognize the greatness of the boon. They do not grasp, it seems, the reality of the fears of European peoples to whom the end of war has not meant security. We think and vote as though we felt that other nations have only to say they are secure to be secure.

These are great things although the people of the United States are not fully aware of them. Another benefit has not been named. The Monroe doctrine, by which the United States has practically guided the affairs of Spanish American for two decades, had never been recognized by the rest of the world before the great war. When recognition of that doctrine was duly made in the treaty of Versailles, the United States received more than any other nation received at Paris. Wilson did not seek the guarantee. He knew it to be dangerous, doubtful insofar as it would affect the peace of the world, and he refused of his own volition to ask recognition. The Senate of the United States, aided by Messrs. Bryan, Hughes, Root and Cardinal Gibbons, compelled him to ask it. The other powers wrote recognition into the treaty, the greatest thing in the treaty in the way of a concession.

For, now the United States and its citizens enjoy a sway and a prestige in all Spanish America that equals the sway and prestige of Ancient Roman citizens in the religions around them. It is a dangerous thing. It means enmity in all the countries south of us. It means interference with the internal affairs of small nations. It means economic exploitation in a region where peaceful trade might be far more valuable without it. Under it our Government is disposed already to re-write the constitution of Mexico. And the sway of the country in Central America continues as it has continued since 1911. The masses of democratic America are confused. They rarely think of the Monroe doctrine as a means of aggression. They would feel affronted, if they were told the Monroe doctrine means to the business interests of the country what the *Drangnach Osten* meant to the business men of Germany before the great war.

Thus the country has won three great advantages as a result of the war and the peace. It does not know it has these advantages. Our political leaders and our newspapers continue to talk about absolute unselfishness and innocence of all desire for gain. It is a dangerous misconception, if not an actual deception. Democracies do not know their foreign relations well. All peoples may readily be exercised about wrongs other nations commit against them, but rarely think of wrongs their governments commit. Was there ever a time when education was more needed and when educators had less to say?

The country occupies the very middle position of the modern world, a position like that of ancient Rome, with the Mediterranean people about her; but no one knows it. The country holds the economic whip hand over the world; and yet our leaders in congress talk about our being cheated out of hard-earned savings; the United States is safe beyond all other peoples, since the day of Augustus Caesar; and yet congress is warned and the people frightened daily lest we be caught unprepared begin to pick England for an enemy. We hear of army and navy plans constantly. With economic supremacy, with a position in the very middle of the world, what a terror we might be if there were an army and a navy, ready to fight at "drop of

the hat". And, with all Spanish America under willing or unwilling tutilage, what more should the country ask? Has Japan ever enjoyed such an advantage? Has any other people ever held so many of the great pawns of history?

With a domestic position critical, with wealth concentrated and suspicion growing so that men wish to try Bismarck's plan of limiting popular representation, it does seem that this country needs to train men to think, take lessons in reality and ponder what distrust of democracy means in our day. All the lessons of the recent war warn us; all the lessons of European history warn us; all the experience of American history says "beware".

BETTER CITIZENSHIP THE ONLY ANSWER.

Since so many millions of men have lost their reverence for ancient religious sanctions; since the old States and their courts have no longer the prestige they once had; since clergymen and politicians have alike been dethroned, either by the discoveries of science or by the workings of democracy, there seems to me only one resource left for modern American society. And that is the citizen with a conscience for the Nation. Let us have the University and I associate the college and the whole army of teachers, high and low, throughout the Nation with the University. These constitute a hope. Yet how little have we taken thought of them! We permit them to be robbed every year in Chicago.

If there are some who think the University a place to prop the fortunes of those who are already secure, they are mistaken. If there are those who hope to make of the Universities places where democracy is to be sneered out of existence, they have been grossly misled. The Universities may not have waked up; the colleges may still be indulging in false hopes as to their privileged positions, where young folk in easy circumstances shall be made happy and comfortable; but it is a false hope. It is too late to try again the role of the universities of the Old South. The University is now, and must ever become more, the home of learning and science, a resort for able men who love research. It is now, or must soon be free, free to think, to teach and to write. Without that freedom there can be no University. Germany tried to bolster her imperialism by University support; by guiding the thought of scholars. Shall democratic America follow that example?

If the country rise to the new demands, it will supply us the new sort of preachers, the better sort of lawyers and young graduates who care less for grandstand athletics and more for the rewards of public service. And they will fill the country with teachers and writers of truth with men and women whom legislatures and the leaders of business will delight to reward with salaries commensurate with the greatness of the task to be performed. Why should the teacher of our children be skimped in his living and crowded into poor, musty rooms for his residence? Who is worth more to society than him who instructs the men and women of tomorrow?

Not a less democratic country will tide us over the dangers ahead; not an ignorant electorate will show us a rational foreign policy; nor shall we learn the great things of civilization by ignoring the very light of history and science. If ever any nation had a great mission, it is ours. Let us not deceive ourselves, the examples and the precepts of Jefferson and Lincoln can not yet be abandoned. Our great democracy shall not yet fail. Let us round out our lives, fill in our gaps of education, abandon our fears of the people born here or brought here by our own hands, and become again a beacon set on a hill lighting the way of all peoples everywhere.

PRESIDENT ALLEN: Dr. Mann has suggested that we all get up and sing "My Country 'Tis of Thee." So let us all rise and sing.

Song..... .... Ensemble

PRESIDENT ALLEN: The next speaker on the program is Dr. H. O. Pritchard of the National Board of the Christian Church Educational Department. I take pleasure in introducing Dr. Pritchard.

EDUCATION AND DEMOCRACY.

DR. H. O. PRITCHARD, *Indianapolis, Indiana.*

MR. PRESIDENT AND MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: The subject assigned me tonight is "Education and Democracy". There are three very simple things I want to say about it. I hope I shall say them so simply and couth them in such plain language as will cause you to remember them. My first proposition is this: *Education is essential to the largest measure of individual success.*

I repeat: Education is essential to the largest measure of individual success. Perhaps, I ought to apologize to this intelligent audience for uttering a truism like that; I suppose there is nobody here that would dispute that simple, self-evident and somewhat trite statement. But, when one understands that there are in this nation of ours whole communities who do not believe that statement—certainly, they do not believe it as applying beyond the eighth grade—who do not believe it is necessary for their children to even have a high school education; and when one knows that of all the men of draft age in the last war, there were one million of them who could neither read nor write; and of the men under arms twelve and one-half per cent could neither read nor write; then I think we who boast about the great public school system in America and about our intelligence must pause long enough even to consider a trite statement such as this.

With your permission I shall begin with a little word of autobiography: My father is a farmer; my brother is a farmer; my wife's father is a farmer. I was raised in Johnson County, Indiana, where the Johnson County white corn comes from. In fact, it was our neighborhood which produced that corn. Now, I remember very well how the farmers of this particular neighborhood used to talk. First of all, they did not believe it took very much brains to do certain things. They would go to church on Sunday and hear some man preach, go home to dinner, and after dinner sit around and talk with friends and neighbors. More than once have I heard a conversation something like this: "Well, if my boy is right smart I am going to make a lawyer out of him; if he is not that smart, I am going to make a doctor out of him; if he is not that smart, I am going to make a dentist out of him; if he is not that smart, I will make a teacher out of him; if he is not that smart, I will make a preacher out of him, and I reckon if he don't have no sense he will be a farmer." My folk always insisted that I stay on the farm. I have no doubt that their estimation of my ability was correct, but they were mistaken as to what it takes to make a farmer. The time has now come when a man cannot succeed on the farm who is not trained for the task.

Another thing, they did not believe in education; they believed in it up to the eighth grade, but that was all. There are still rural communities who do not believe that their children ought to have an education. But I am here to defend the statement that education is essential to the largest measure of individual success. Please remember that I am not talking in terms of college diplomas. Perhaps by common consent the three greatest Americans were George Washington, Benjamin Franklin and Abraham Lincoln, and they never saw the inside of a high school. The total schooling of two of the three amounted to only a few months, but to assume that they were uneducated would be a colossal blunder. George Washington advocated the establishing of a national university in Washington; Benjamin Franklin founded the University of Pennsylvania; and one of the greatest acts of Abraham Lincoln was the signing of a bill that brought into existence fifty-two colleges and universities. Those men, although they received very little schooling, were highly educated men and believed profoundly in education.

"NO TIME LOST IN GRINDING."

I never go to the city of Springfield but what I go around to the old home of Lincoln, and I always like to look at the place where that tree stood and where Lincoln used to come home from his law office and get his old split-bottomed chair and sit down and then put his feet up against the side

of the trunk of that tree, and there he sat and mastered every proposition in Euclid. He did it after he was forty years of age, and no mind except a mind of the first order could accomplish such a feat.

The best lesson which I ever received in this matter of an education being essential to success was given to me by a railroad conductor. I was riding on one of these slow moving trains. It had gone about five miles when it side-tracked and let a passenger train going the other way pass. Five miles farther it took another side-track and let a freight train going the other way pass. Five miles farther and again side-tracked to let a train going the same way pass by. Then I grew disgusted and said to the conductor: "Mike, why don't you make better time in this road." He said, "Did you ever railroad?" I said, "No." He said, "I thought so. If we undertook to make the time that that train is making which just passed us we would go into the ditch at the first steep curve, for our engine is too light and the coaches are not ballasted"; and he then said, "Sir, this train is not equipped for fast running." Now, I want to tell every boy and girl in this audience tonight that unless you are equipped for fast running, you are going to have to take every side track to which you come and let the man who is equipped pass on and reach the destination first.

Another excellent lesson in this regard was given to me by my father. There was one task I had to perform on the farm which I could not forget if I would and would not if I could. It was the turning of the grind-stone. My father always did the holding while I did the turning. Father is a man who weighs over two hundred pounds in his shirt sleeves, and he can ride a grind-stone easier than anybody I ever saw. Well, on one occasion we had the dullest old scythe I ever saw. So I turned and I turned and I turned until my left arm was tired, and father rode; and I turned and turned then until my right one was tired, and father rode. Finally I said, "Father, don't you think you better get off and rest awhile?" It was then that my father gave me the most beautiful present that I ever received from him. I shall never forget it. He presented me with a beautiful American flag; he gave me the stripes and I saw the stars. But I kept on turning and turning until my left hand was blistered and I turned and turned and turned until my right hand was blistered, and then I said in a petulant way, as only a Hoosier boy can, "Ain't that old scythe ever going to get sharp?" And it was then my father said this to me,—and, boys and girls, if you forget everything else I say tonight, I hope you won't forget this sentence—"My son, there is no time lost in grinding." That afternoon when I went out to use that scythe blade, I learned that my father's words were true, and I have learned better still in the great field of life that they were truer than he dreamed. Therefore, when you become discouraged and the road is hard, when you want to drop out of school and hunt a job, when money looks more attractive to you, will you please remember that on the 19th day of February, 1925, you heard a man say, "There is no time lost in grinding"? And if you will only keep it up, you will never be sorry that you went ahead.

THE FINE ART OF COOPERATION.

Now I come to the second proposition which is just as simple as the first. *Education is essential to the largest measure of group success.*

By that is meant, community success; mass success; the success of the rank and file and of the whole group. The speaker who preceded me said some very wonderful and some very true things about democracy tonight. That is a word that we all like to talk about. You know, one of the interesting things is this, that we like to use words; we like to play with them. A thing that every demagogue knows is that can hypnotize the audience with a slogan. Every political and religious demagogue knows that. But what is democracy? Some people call it a form of government; some people define it as some phase of liberty; some people just now are talking about it as applied to industry. I think the best definition of democracy which has ever been evolved was given by Professor John Denny, when he said: "Democracy is more than a form of government; it is a mode of associate liberty."

What is education? Well, it was Mr. George Edward Woodbury who said that education is learning to love the good, the true and the beautiful. It was Matthew Arnold who said that education is coming to know a good man when you see him. I think it was Professor James of Harvard who said that it was the acquirement of certain modes of thought and certain habits of action. If I were giving a definitoin of education, I should say it is learning the fine art of cooperation; learning how to live together; how to play together; how to do team work together. You know, one of the finest things in our educational system is athletics. They have tremendous educational value, because they teach those boys that team play and team work is far more valuable than any single man being the star. What do you think a football squad at the university would do to a fellow that would whine and cry if the quarterback did not call his number every time? Yet, in all organizations, you have people who won't work unless they are a chairman of a committee; people who won't play unless they are put in the lead.

I heard a story recently of one of these non-cooperative fellows who joined the Baptist Church and broke it up; he joined the Presbyterian Church and broke it up; he joined the Christian Church and broke it up. He then applied for admittance to the Methodist Church. They put him on probation. At the end of six months when it was about time for him to be admitted to the church, they held a prayer meeting and the minister of the church called on one of the good stewards to pray. His prayer was something like this: "Oh, Lord, thou knowest how this brother joined the Baptist church and caused it to be divided; how he joined the Presbyterian church and caused it to be divided; how he joined the Christian church and caused it to be divided; and now he has applied for admittance to our church. Oh, Lord, we hear that brother so and so is very ill, and if it be Thy will, we pray that he be removed from this earth and sent to the lower regions, for we are sure he will break them up too."

NO DEMOCRACY WITHOUT EDUCATION.

If democracy is a mode of associate living and if education is learning the fine art of cooperation, do you not see how education and democracy go together? Do you see how intertwined they are? Do you see how interdependent they are and how you can't have one without having the other?

I said a while ago we like to conjure with words and one of the words is "democracy."

I was talking with a man from India the other day and he tells me that a thousand miles from a railroad, up amongst the foothills of the Himalayas, wherever men are gathered in the little villages they are talking about democracy and the self-determination of nations. I was talking with another man from equatorial Africa and he tells me that in the tropical forests, far removed from civilization, wherever those savages sit around the firesides at night, they are talking about democracy. But, you cannot have democracy as long as the mass of the people are ignorant. Talk about Russia becoming a democracy as long as ninety per cent of the peasants can neither read nor write! That same thing holds true for Mexico where ninety-five per cent of the total population is illiterate. It is just about as safe to put a razor in the hands of a baby as to put democracy in the hands of an unlearned and ignorant mass.

In 1920 I had the good fortune with some of my friends to visit Plymouth, Massachusetts, and stand on Plymouth Rock, where 300 years before those brave forefathers of ours first set foot on this new continent. We were very fortunate to be there that day for they had taken down the iron railing and were preparing to move the rock under the pavilion where it now rests. So, we had the privilege of climbing up on that rock and standing on the identical spot where those Pilgrim Fathers set foot. When I mounted that rock I took off my hat and looked up toward heaven and uttered a silent prayer, thanking Almighty God for those brave men and women, those intrepid souls who braved 3,000 miles of unknown seas to come to the shores of a new continent; to blaze out paths where highways

never ran; to lay the foundation for the greatest nation on earth. After standing on Plymouth Rock we walked up to the top of that little knoll where they laid to rest half of their number that first winter, burying them at night and obliterating all signs of their graves, so that the Indians would not know how many were dying. Then we went down to the place where they built their first church and walked to the top of the hill where they built their first school house. When the Pilgrim Fathers built their homes and that church and that school house, they were laying the foundation for this great Republic. And without a great public school system underneath it you can never have perpetuated to posterity the high ideals and religious liberty, which have been vouchsafed to us, through this Republic.

The lady who spoke just before me is from the state of Virginia. The other day I was in the city of Charlottesville visiting the University of Virginia and seeing the home of Thomas Jefferson. He was not only the author of the Declaration of Independence, a statesman, a President, but the greatest thing about Thomas Jefferson was, that he was one of the greatest educators that America ever produced. No one man ever gave birth to as many great educational ideas as did Jefferson. He was the author and the founder of the first state university in America; he was the author of the honor system; he was the author of the elective system of education; he was the author of vocational education; he was the author of a bill granting religious liberty in Virginia and advocated the separation of church and state in educational matters; he was the author of the idea of establishing schools of religion in connection with state universities; but above all else he was the first man of importance in America to advocate a great common school system—equal education for both men and women, rich and poor, black and white alike. Has any man in America been the author of so many great educational ideas? Some of them have come to pass and others are only now being realized, one hundred years after his death. This great advocate of democracy knew very well that you could not have the idea of all men being equal, that you could not have the thing that the speaker who preceded me talked about so eloquently, unless you had a great public school system upon which your government and all its institutions rest.

THE RIGHT KIND OF EDUCATION.

My third point is: *Education is not only essential to individual and group success, but the right kind of education is essential to both.*

I am not willing to maintain that any kind of education is essential, for I am here to speak in behalf of the right kind of education. I wonder, after paying these compliments to our public school system, if you will permit me to point out one or two weaknesses into which I think we are rapidly drifting? The first is overemphasis upon specialization. We are beginning in the grades to specialize along some narrow lines, and we carry it then through the high school; through college and university, and then up to the post graduate school, specializing along narrow lines until we build a man a mile high and a foot wide.

Now, to illustrate what I mean: When I was a college president I needed a lady for the English department and looked around and writing letters I finally decided that there was a certain individual whom I thought woul fit into that situation, because she had a wonderful academic record back of her. I wrote for her to come and visit the institution. She came. We entertained her in our home. I observed that she had attended one of these large high schools where the elective system was in vogue and where she didn't have to take what she didn't want to take. She wanted to take English. She went to a university where the prescriptions are at a minimum and where she could take anything she wanted to take, and about the only thing she wanted to take was English. About the only thing she had taken was English. She had also earned her Master's degree in English. At the dinner table, as the condiments were being passed, I happened to remark, "Isn't it strange that salt is the only pure mineral that comes to our table?" And with perfectly unconscious humor and with the innocent expression of a child of six, she replied, "Why, no, there is sugar." She didn't know that sugar was a vegetable. She knew her own little subject, but

was ignorant of the vast field of learning that lay all about her and which she must know in order to know her own subject as she ought to know it.

My other point is this: an over-emphasis on bread and butter. We are saying that boys and girls ought to be taught to do something. I think it is a mighty good thing for a man to learn to run a jack plane or a saw, and a girl to be taught to bake biscuits and make bread, but there is danger. The danger is this: there are institutions in this country today that are boldly announcing in their catalogs that it is their chief business to fit men for a job. That is what I call a bread and butter education. It is important to fit men for a job, but it is more important to make a man than it is to make a mechanic. And I would rather have him know some of the great ideals than to become rich as Croesus. "Man lives not by bread alone, but by every word that proceeds out of the word of God." I still believe in those institutions of learning which lay emphasis upon the worth of ideas and the glory of ideals. We are in great danger of turning this whole educational system into a supply house for the economic and industrial demands of our day. Turning out artisans and tradesman as the wheels of the mint turn out the dollars and dimes, forgetting that the greatest thing in education is, after all, ideals and character. We need to examine our objectives anew to see whither we are drifting.

I love this great country of ours. I would rather be a citizen of the United States than any nation on earth. I would rather live under the flag of the Stars and Stripes than any other that ever unfurled itself to the breeze, but I am not unmindful of the fact that America is the graveyard of two races, and that she might be for a third, and I say that only because I see our educational system moving in the wrong direction and I am trying to call it back to those great fundamental, everlasting ideas which brought it into existence.

In closing let me recite Kipling's poem:

"God of our Fathers, known of old,
Lord of our far-flung battle line,
Beneath whose awful hand we hold
Dominion over palm and pine—
Lord God of Hosts, be with us yet,
Lest we forget—lest we forget!"

I shall conclude, ladies and gentlemen, with these three simple propositions, namely:

Education is essential to the largest measure of individual success; education is essential to the largest measure of group success; and, the right kind of education is essential to both.

PRESIDENT ALLEN: We will adjourn now until nine o'clock tomorrow morning.

FRIDAY MORNING SESSION.

February 20, 1925, 9 o'Clock A. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN: We will commence this morning's program with "Community Sing", led by the Rev. Gordanier.

Community Sing ..... Ensemble

PRESIDENT ALLEN: I am going to ask Mr. Mann to come forward please. Mr. Mann is probably a stranger to most of the citizens of this district, so I want to introduce him and ask him to take charge of the meeting this morning. This is Mr. Mann.

CHAIRMAN FRANK I. MANN: LADIES AND GENTLEMEN: It is not true what the President just said, that I am a stranger. I feel very much at home in and about Paris. It has been my privilege to represent Edgar County on the Institute Board ever since the new apportionment, if any of you can remember as far back as that. That has led me into Paris many times in the past and I feel well acquainted with many of the faces in Paris and the farmers around Paris.

During the discussions for several years past in reference to places for holding our annual meeting, we have been telling the Institute Board that at Paris there was the best spirit existing between the city people and the country people of any place of similar size in this state, and that that spirit would bring to the Institute a number of people and the class of people which would make it one of the best meetings that the Institute has ever held, and I am fully convinced that our prediction has been fully verified in the meetings we have been having this week. The attendance has been the capacity of the church and the class of people in attendance superior to most audiences in the state; in fact, the class of people was so high that we very near put our big Chicago friend off his feet on this platform the other night. Could you see that he lost his head? He had been talking to groups of city people, and when he met you people here and looked into your faces and saw your souls reflecting back to him, it was so much superior to what he had been used to that he lost his head and he didn't know what to say on this platform. Now, that is a fact, and I would say it if he was here, and I think he said it afterwards that he was not expected having to talk to such a high class group of people.

Now, we have a very important subject on the program for this morning, "Farm Poultry." I don't know as I can tell you the magnitude of the poultry industry, but I guess Mr. Hale can. I will give you an idea of what I think its magnitude is: if all the eggs that are laid every day were made into an omelet, it would make an omelet bigger than the state of New Jersey, and if all the roosters were to crow at one time they would make a noise that the man in the moon would hear.

Now, I am sure that our speaker this morning is one of the best in the state on the discussion of the poultry industry, so I take pleasure in introducing Mr. Hale.

FARM POULTRY.

D. E. Hale, *DuPage County, Illinois.*

Mr. Chairman, Ladies and Gentlemen: Like our preceding speaker said, I, too, have been rather astounded at the immense gatherings at the Institutes that I have attended this year. At the Institute up a Sycamore, DeKalb County, the hall was packed, and they told me it held twelve hundred people. I never had seen so many people gathered to hear somebody speak on chickens. Before I went there I went to an old German friend of mine who had spent considerable time in this kind of work, and I said, "Now, I am going out to talk to a pretty high class lot of people, and I would like to get a few pointers on putting over a good talk." "Well," he said, "put your hands in your pocket." I said, "that is easy; but then what?" He said, "Keep your hands in your pocket." "What shall I say?" I replied. "It is easy enough to stand there with your hands in your pocket. What is the idea?" "Well," he said, "just the minute you begin to go this way or that way (illustrating), just that minute you begin to make a darn chump of yourself." So I am going to, or, rather, would like to keep my hands in my pocket, but that is rather hard.

D. E. Hale.

Now, the Reverend this morning started roasting us fellows because we couldn't sing; I am so stuffed up with a cold I can hardly talk, which reminds me of a political speaker I heard last fall. He had been doing a lot of talking and he was hoarse, and the folks in the back row couldn't hear him, so somebody in the back row shouted, "Louder." Well, he put on a little steam and started again, and for the second time the voice shouted "Louder". Then somebody in the front row got up and said "Sit down, you big chump;

you ain't missing nothing anyhow." So, if you folks in the back seats don't hear me, you are perhaps not missing anything anyway.

As a usual thing at Farmers' Institutes, they generally call upon us chicken fellows to talk "chicken" and then they say "We will give you thirty minutes." Now, the chicken subject is so big and has so many angles to it that you can't get a good start in thirty minutes; so, if any of you are not interested in chickens, I suggest you take a recess right now.

The thought comes to my mind that here is a gathering of delegates from throughout the State of Illinois and some from the neighboring states, and the question is whether you are particularly interested in having me talk something about the things we do in raising chickens or whether you want me to talk about the other end of it, selling the eggs after you have produced them? I am not going to give you any prepared, set speech; I will ramble along in the hope that you may get a point or two out of what I have to say.

My work as a poultry judge takes me throughout the country. This year I have judged from Jacksonville, Florida, to Tacoma, Washington and back through Missouri and as far north as Minneapolis. While on the coast I was very much impressed with the work being done out there by the Pacific Coast-Co-Operative Poultry Producers Association. I don't know how many of you are familiar with the work that they have been doing out three, but it really seems funny when you stop to think of it, that eggs produced on the Pacific coast are topping the New York market and have been for the past two years, with the possible exception of during the past year, when the Atlantic Coast Producers have organized along similar lines and are now running about even with the Pacific coast eggs.

Before telling you anything about how their organization is handled, I want to state that about a year ago Mr. Harry R. Lewis, President of the National Poultry Council prepared an article for the Country Gentlemen entitled, "What will happen to the coast egg producers when the corn belt farmer goes into the chicken business?" And he told me that he didn't dare publish it for fear he would wake us fellows up and start something that would really give the coast Co-Ops a big set back. Now, when you stop to think that the coast producers buy most of their feed from this territory, feeding it to their chickens and then shipping the eggs clear across the continent, we really ought to be ashamed of ourselves.

Six years ago I was out here judging, and I found poultry houses nailed shut all over the states of Oregon and Washington. They were making some very scathing remarks about the Eastern breeders, the prices they were charging for their breeding stock, etc. Today since they have organized, and have broken several world's records in egg production and are topping the New York market, and they tell a different story. They are producing 340-egg-per-year hens and so on, and the easterners are paying them a big price for them. They have paid as much as $1,000 for a pen of five birds, $250 for a sitting of eggs and $500 for a male bird. The lowest price I could get on a bred-to-lay male bird was $50. So, there is some pleasure in analyzing their situation today compared to six years ago.

I am not a popular speaker in talking to Farmers' Institutes. I was talking recently with a professor who teaches public speaking, and not having had any training along these lines asked him for pointers, and he said, "I will tell you one way to play safe. You just tell them something they already know and you will please them, because then they think you are a wise fellow, but just the minute you begin rubbing the fur the wrong way, you are going to be in disfavor." Now I have a habit of rubbing the fur the wrong way, but I don't care so much about that if I can only cause you to study and think these things over and dig into them.

We talk co-operation in all lines of work but we forget the big element, the human element, which is a necessary part of it. You can't cause people to co-operate and love their neighborhood and their fellow man simply by putting in a set of rules, unless you have some punch in it. It has been tried on the coast, it has been tried in Missouri, where they would organize and draw up a set of rules that you would have to agree to this, that

and the other, and they didn't get anywhere. The big Chicago packing man would come in and open up a local station where he would buy a case of eggs and raise the price two cents above what the local organization was paying and then the first thing they would know, one of the members would call the packer and say, "I understand you are paying so much for eggs?" "Yes." And that would be the start. You would probably hear this next, "Now, I belong to the Co-ops over here; would you mind if I slipped in two or three cases about nine o'clock tonight?" "No, sure, bring them over." Now, that was what he was there for; that is the kind of tactics that would bring about the disruption of the local organization. They did that in several instances.

They have learned their lesson on the coast. They have formulated a set of rules whereby a man caught selling outside of his own organization is fined $250.00, and after a few paid that fine they began to get somewhere. Now, they have a wonderful organization. They have their selling organization in New York City; they have their own store or auction room, as they call it, where the eggs are shipped by the carload, and the New York buyers come there and bid for those eggs. They are making many changes. For example, a standard egg is twenty-two ounces to the dozen. They are producing 26-ounce eggs and they won't ship less than 24. They are aiming at 26-ounce eggs, giving us fellows a mark to shoot at, so that when we do get busy they are going to be so established by producing those great, big eggs, that it is going to take us some time to catch up with them.

In order to make those big, white eggs stand out they have induced the manufacturers of egg case fillers to manufacture a blue colored filler or carton, and if any of you haven't tried it, just try to put up eggs with that blue back-ground and see how much nicer they look. Those are selling points they are putting over and it is paying them money. As they organized out there one town after another joined as a local branch, and as they would develop they would say; "Well, we have to have so many birds, and in order to feed them at a profit we will have to have our own feed mill." Then they would call a meeting and say to the members "Are you willing to spend two cents a dozen on your eggs for the next two or three months?" No doubt they would all be in accord, and the first thing you would know they would have fifty or sexenty-five thousand dollars to purchase a mill with, and nobody would notice it, whereas, if you asked those fellows to dig down in their pockets and hand out so much money to buy that mill, they would never get it in the world. Through their co-operative organization they are doing these things. In the State of Oregon they own several of their own mills. Their stations are used as community centers, and not only for commercial purposes.

I met two or three of my old friends, who are located there, and one fellow in particular that I used to know very well said, "The wife and I are here now; the children have grown up and gone; we have our nine hundred Leghorns and three acres of land and we make better than a living; we are independent, we are happy and there is nothing in the world did it but this co-operative proposition."

On the other hand, as far as Illinois is concerned, I came near coming down here with a pair of black eyes. About four days ago on the elevated platform in the city of Chicago there was a fellow handing out handbills asking the people to boycott eggs until the price got lower, and the handbill bore a union printer's label. I took one of them and I said, "Are you a union man?" He said, "You bet your life I am." "Well," I said, "that is fine business. You fellows are well organized; you have fought until you got your wages up, your working hours reduced, everything your own way and now they have time to delegate you to come up here and knock the producers out of business. It is alright as long as you fellows get your own way."

It happens that I have been in the publishing business ten years, and that is what caused what few grey hairs I have trying to get along with those fellows. However, the idea impressed upon my mind was, what in the world can we do if those fellows are organized. The women's club of Chicago are working hand in hand with them, and when they think eggs

are getting a little too high they try to put a boycott on; but, eggs they must have.

Well, we had quite an argument, but I had no comeback. He said "Why don't you organize; get up an egg union of your own?" You know he pretty near hit the nail on the head. We talk about supply and demand governing the price of all these things! Well, it does, but I can't figure out why eggs should be so cheap as they are today. They tell me that the farmers are getting only 38 cents for eggs; we are getting 65 cents for ours but we are selling direct to a private concern that sells them to their employees and also uses a lot in their own restaurants. The ordinary egg is selling in Chicago for 54 cents.

There are less than 2,000 cases of eggs in cold storage in Boston, Philadelphia and Chicago, according to yesterday's report, as against 100,000 on the same day a year ago, so I can't see why the production should be any greater right now than it was a year ago, or why eggs should have taken such an awful drop in price. One of my friends says he picked up four dozen fine eggs for thirty-five cents. "Where did you get them, out in the country?" "Well" he said, "I happened to be calling on a merchant and the farmer's wife brought them in and I asked her what she was getting for them and she said eggs are coming down and I will have to get 35 cents for these." He was tickled pink to get them; he would have paid her 70 cents because he knew they were right fresh from the farm. That woman was not properly posted; there was nobody whose business it was to post her. She would have gotten twice as much for these eggs as she did.

The State Agricultural Association has been making an investigation. You know, figures are dry facts, but sometimes they are worth having in mind, and as far as the county is concerned, I won't mention it, because I don't want to embarrass anybody. It was not this county, however. The government says that we rank third in the States for poultry and egg production, yet in this one county they average only 155 fowls on each farm, and they average selling 45 hens and 45 males each year. The common practice was to sell fowls without any special fattening, as they claimed they were fat enough for eating from what they picked up around the farm. Of the flocks canvassed eighty per cent of them were scrubs, and twenty per cent of the flocks are grades and pure bred. A lot of them did not have more than two or three roosters around the place. Out of the four hundred farmers questioned, 287 said they washed their eggs and 72 of them didn't; yet nearly all of them acknowledged that they should not. In regard to the housing question it showed that only five of them had a modern poultry house; 25 per cent of the houses were graded as medium and the rest were shacks; the average house space per bird was 2.2 square feet per bird when it should be at least 4; they averaged one nest to every other hen, when they should have at least one nest to two birds and they averaged cleaning those nests three times a year. Is it any wonder,—and I am about to rub the fur the wrong way,— that a hen will steal her nest when her nest is only cleaned three times a year, and there is only nest for every seven hens. In our egg laying contests we have one nest for every two hens.

SOME POULTRY HOME POINTERS.

Now, just a word in regard to poultry houses. There is absolutely no excuse for existing conditions in this respect in our state. I don't mean to say that you have got to have an expensive, elaborate poultry house; absolutely not; but I doubt if there is a farm in this state but what there isn't a building or shed that has a side end of it that could be made into a perfectly comfortable poultry house at a very little expense. A chicken is a good deal like a hog; it will keep clean if you give it a chance, but if you force it to live in filth and drink from the barn yard pools, naturally it is going to do it, and you can't expect good production. Fresh, clean water is one of the most important things in the manufacture of eggs. How many of you take the time to give your birds a pail of fresh water every morning or to keep the founts cleaned out?

A poultry house should be dry, well ventilated, with an opening on the south side to admit the sunshine; that is the principle feature of it. Another important feature is the matter of nests. There is no reason why you should not have plenty of nests. I don't know where straw is any chaper than on the farm. I am paying $20 a ton for it. There is no reason why the Illinois farmer should not produce a top-notch egg, an egg that does not have to be washed; there is no reason in the world why he should produce an inferior egg, or unfertile eggs, but you can't do it by letting two or three males running around in the flock. That is rubbing the fur the wrong way again.

The government says that the average farm hen produces 65 eggs per year. I dare say that the average back yard hen of the small town fellow will produce 144 eggs; that is 12 dozen. I was talking with a farmer at the hotel this morning and he stated that about four years ago they used to go out and get from three to four eggs a day; now he is bringing them in by the pail full and he hadn't as many chickens as he had at that time and he is only using about half of the feed. He sold something over $400 in poultry and eggs in February, simply because he woke up, culled the flock, got rid of the star boarders and began to breed some better layers, mixed a little brains with his feeding, and today he is very much pleased with what poultry has done for him on the farm.

About ten days ago I talked for WLS, the Sears-Roebuck broadcasting station, and I happened to be speaking on some new wrinkles on poultry raising, and among them I mentioned the feeding of cod liver oil, and judging from the stacks of mail I have been receiving ever since, there is so much interest manifested that I thought perhaps you folks would like to hear something along that line.

How many of you are interested in feeding chicks? (Many hands raised.) I won't tarry any longer on this subject of co-operation and the need of organization in this state, but folks, I do hope you will wake up and go home and organize. Before I leave the subject I want to mention this town of Paris, where the local poultry association has put in a co-operative incubator at the County Farm Bureau Headquarters. That is a wonderful thing. Here they are now with their own incubator, and their flocks have been inspected by the State Inspector so that they can turn out an accredited chick, and already they have sold their output up until the month of May, with no advertising or expense for selling. The people know what they are getting and they can see the flock that the eggs come from. It is a wonderful thing; it just shows you what can be done by organizing.

CO-OPERATIVE MARKETING.

As to marketing, let me say this one more thing: take a thousand pounds of live poultry, for instance, that poultry is shipped to Chicago, and the commission man ships it to a man who has a trade worked up, and finally the retailer sells it to the people. Now, all those men made a profit. This poultry, we will assume, was sold originally for 12 cents. Now, suppose the farmer had taken that 1,000 pounds of poultry, taken the feathers off and cleaned it, cooled it, carefully packed it in a uniform manner and shipped it direct to the market. He would have received 28 cents a pound, or $160.00 for his work, and I don't know where a farmer could make any easier money than that. A great many people say, "We only have a dozen or so to sell at a time." Well, then, if that is the case, get all of the farmers in the neighborhood together who have those small amounts and let them put on a picking bee, or a picking contest. If you could have seen the crowd at Sycamore, where Mr. Hockings was putting on his picking and dressing demonstration you would have seen how much interest there was. That fellow picks the feathers off, takes out the back bone and insides, and the chicken is ready to lay in the frying pan in ten seconds. Of course that is his best record, but he does it 14 and 15 seconds right along. It doesn't take very long to pick a chicken if you go at it right. Now, I know a lot of you people don't believe that. I

have seen audiences that wouldn't believe it after they saw it. He will do it slow for you to show how it is done. Then he will do it so fast that you can't see him, and if there is a pin feather left on the bird I shall be willing to eat it. I merely mention that to show you that these things can be made enjoyable and you can get a little fun out of it. You can bring your chickens to one place and you can check them in, weigh them and get a receipt for it, and then after they are picked and cleaned they are sent to the market in one lot, and when the check comes back it is divided according to the receipts you hold.

Now, some of the people in DeKalb county tried that out but in this case they shipped the poultry to a retail commission merchant. Fortunately the proprietor of a very fine restaurant on the north side of Chicago happened to get hold of that particular shipment, and he got the address of Mr. Roberts, the county agent off the tag, and he wrote him direct. The result is that community is now shipping their dressed poultry right to this restaurant, and most of the time they get 38 cents a pound. What else have you on the farm that will come anywhere near 38 cents a pound?

DISEASE AND EMBARGOES.

Just in a few words let me mention this matter of embargoes that you have heard about so much. Briefly, a month or six weeks ago the big buyers of live poultry in New York began to have tremendous losses by fowls dying, both enroute and after they arrived there. Several things were given as the cause,—bronchitis, pulmonary troubles and what some called the European pest, another pulmonary trouble, sort of a diptheric condition. Then the government got busy and isolated it in three states, Pennsylvania, New Jersey and New York, and consequently we have embargoes. I understand also that some of the counties in Illinois may have an embargo. Since having these embargoes, the big question is, how much publicity shall we give it? In speaking of this subject to a friend of mine he said, "The more you tell them about it, the more you are going to spread this up their places." There is only one way to eradicate these diseases and hysteria." And I said, "I hope I will, so that they will get out and clean up their places." There is only one way to eradicate these diseases and that is to clean up and disinfect and get rid of the sick chickens. I am mighty glad that the government and the state authorities have put embargoes on, because that is going to force us to do it.

The National Poultry, Butter & Egg Association held a meeting in Chicago on January 15th, and for two days and half they talked about the horrible effect of these diseases and the effect of the embargo, and along about Saturday afternoon a fellow got up and he said "The cause of all this is the chicks being sent out to the farmer, and we have right in my home town a hatchery that is doing so and so." Unconsciously, I clapped my hands. The meeting was very strained. They were calling each other "guys" and a fellow would forget himself once in a while and swear; they were very much worked up. So, when I clapped my hands the President said, "Some guy back there clapped his hands when they mentioned baby chicks; I would like to have him stand up." I stood up and I said, "Well, I am the guy you are talking about." He said, "Come up here where the stenographer can see you." So I pushed my way through the crowd, and said "If it is necessary for the stenographer to see me, I hope she will take a good look because I have a lot of blood in my eye." I said "This man has accused the baby chick of being the cause of all this trouble." So the President said, "Wait a minute, who are you? What is your business? Who are you connected with?" I said, "My name is D. E. Hale, President of the Illinois Baby Chick Association. This man is claiming that the chicks from his town is what is causing all this trouble, therefore I am here to defend the Illinois chick. The chicks that are sent out are not the cause of these diseases at all. The Illinois accredited chick laws or rules are the strongest in this country. Illinois has adopted a set of rules that is turning out the best possible chick that can be turned out. Last year we

started with eight members and now we have 126 hatcheries in the state, and they are all tumbling over themselves to get in." And so the argument went along.

Now, in order to put out an accredited chick, it means that the flocks that produce the eggs must be culled; they are culled by a state inspector. That means that all fowls of low vitality; not pure-bred; all poor producers, etc. are thrown out and are usually sent to market.

I also told the meeting that ten days before I was standing on a depot platform, and it seems to me it was eighteen below zero, and I saw four cars of poultry passing through on a fast train, and all I can say is that the "guy" that shipped them should have been made to ride with them. Take a bird that was somewhat low in vitality and then subject it to that condition, is it any wonder they contract pulmonary trouble?

FEEDING AND CARE OF CHICKS.

Now, for the baby chick! If any of you are going to buy chicks this spring, I don't care where you buy them, but I am telling you for your own good that it will pay you to buy accredited chicks. Most of you know what an accredited chick is, but for those who do not know, let me explain. An accredited chick is one that comes from a hatchery that gets its eggs from a flock that has been inspected by a state inspector. This state inspector has to pass an examination at the state college, which means that he knows his business. He culls your flocks and gets rid of the breeds that are not pure-bred, that are low in vitality, that show evidence of being poor producers. He sees to it that you have a proper number of males, and he has to put a leg band on every bird that he inspects. He also inspects the hatchery to see whether it is being kept in a sanitary manner. That is where your accredited chick comes from. Last year we had different grades of accredited chicks, but that was done away with, so now if you have accredited and inspected chicks you know that they have not only been accredited, but tested for the white diorrhea trouble as well.

Supposing we have accredited chicks to start with, the big loss in the chicken business then comes by reason of losing your baby chicks. We formerly said if 50 per cent of the eggs we put in the machine were fertile and we hatched 50 per cent of the fertile eggs and then raised 50 per cent of the chcks we hatched, we would do well. Now we claim if we don't get 60 chicks out of every 100 eggs we put in the machine, we are not doing well, and the man who can't raise 90 per cent of the chicks he hatches is not doing very well. So, you see, we are doing much better than we did a few years ago, because we are beginning to find out the why of these things. The big loss in chicks comes because we feed too soon and too much, and we do it with our pigs and calves and everything else. Science tells us that Vitamin "B" is found in three places, the yolk of the egg, milk, and the leaf of the plant. Now, just stop to think. What is the first food a suckling animal gets? Milk. What is the first food of a bird? The yolk of the egg. In the last 24 hours that the chick is in the shell, this yolk is taken into the body of the chick. If you don't mind wasting a few chicks try dissecting a few. It takes 72 hours for that yolk to become digested and assimilated and it is only after 72 hours that the chick has sufficient strength and room enough to take care of the feed that you give it. Now, you can readily see if you feed that chick too soon or too much what takes place; it goes so far and no farther and it causes impaction; the stuff decays, causing gases and acids to form. These irritate the digestive tract and is manifest in a looseness of the bowels, and then the people say it is white diorrhoea. Eight times out of ten cases it is not white diorrhoea at all.

Some people say to me that the chicks were hungry; that they picked at everything, hence must be hungry. That is merely animal instinct. It is natural for all infants to put in their mouths anything they can get hold of. Do not feed your chicks until they are at least 48 hours old, and if you have the heart, let them go 60 hours, because the chick will be that much better off. And do not feed them very much. One of the best starting feeds is a little plain oatmeal. Spread on a dish or clean paper or board or some-

thing like that. Let them pick at it for a while. As we take the chicks from the incubator and put them into the brooder, we dip each little beak in warm water. Be sure and take the chill off the water in doing this. Cold water will chill them and cause digestive disturbances. Always take the chill off the drinking water that you give the chicks. In giving them oatmeal or toast crumbs, give it to them about five times a day, but leave it before them only a few minutes; do that for three or four days, and then you can begin sprinkling scratch grain around. As soon as they are strong enough to scratch, be sure and bury the scratch grain so they will have to dig and work for it. I was in the feed business for about eight years, and I did not hesitate to say that the best part of any scratch feed is the scratch. It is the exercise they get that assists in digestion. Afer about four or five days you can begin putting the mash feed in front of them and leaving it there all the time.

Our State College has some very good rations for feeding poultry they will be glad to send you, but until I can get a mixer that will mix it properly for me, I prefer depending on some good commercial feed. There are several good ones on the market.

After giving this feed to them I would begin feeding them yeast and cod liver oil, probably also around the fourth or fifth day. The question is often asked me why I use yeast. Our scientists tell us that in Vitamin B they have found that yeast contains more of it than any other known element. I don't suppose it contains any more than the yolk of an egg, but at the same time we can't afford to feed yolks of eggs to chicks any great length of time. The value of yeast comes in two ways: first, from the value of Vitamin B which it contains, and second, from the fermentation process. Fermentation opens up the feed so the digestive juices can get in and do their work easier, and we get better assimilation, or as the slogan we use "makes any ration better." In Glen Ellyn at the egg-laying contest we are doing a lot of experimenting with yeast. We thought at first that the longest period of fermentation that we dared use was two hours; we were afraid that after a certain period that the food would sour and develop bacteria that would cause trouble. Now we get our best results by letting it ferment over night, and instead of using two per cent we can get just as good results with one per cent, and we may find out later that we can get along with less than that. There is a lot to be learned yet along that line. Take any good mash mixture, add one per cent of yeast, and mix with luke warm water and let it stand back of the stove or radiator over night and ferment. In the morning you will have a nice rise. This should be fed as a warm mash of a crumbly consistency. Feed what they will clean up in a hurry rather than all they will eat.

Q. What kind of yeast are you using?

A. We are now using Yeast Foam. It is about a third less expensive than other brands, and will answer the purpose just as well.

Q. What percentage of actual yeast is found in Yeast Foam as compared with the other brands?

A. Well, I am not prepared to answer that.

Q. Is there any distinction between the dry yeast and the distilled yeast?

A. I really don't know. There are 179 different kinds of yeast.

Q. Couldn't we housewives make our own yeast?

A. Yes. I know one farmer's wife who is doing that, and she is getting wonderful results.

Cod liver oil is sometimes referred to as liquid sunshine. Up at the Wisconsin Agricultural College they claim that they can do anything with sunshine that we can do with cod liver oil, but the sunshine must be direct. Any time that the sun's rays come through anything like glass or cloth or anything else, the ultra violet rays ars so diffused that they lose their effect.

Q. How do you feed cod liver oil?

A. The big problem in feeding cod liver oil was to get a good mixture. The best plan I found was gotten up by a young man who got his training up at Mooseheart. He is a soldier boy that took advantage of his government training, and he has really given us something worth while in poul-

try raising. He absorbs it with charcoal. He puts the charcoal in a big drum that revolves and the cod liver oil is sprayed on under pressure. I am buying this kind of feed by the hundreds of pounds. I can give you this young man's name if any of you desire it. We use that in two per cent amounts and mix it up with our dry mash. In raising chicks last year, out of 750 chicks I lost 3 and one of those was killed. Whether that was yeast or cod liver oil or fool luck, I don't know. Two years ago I had very near as good results.

I am not a college man, not a scientist, and a lot of these fellows stump me in asking me the why and wherefore of things, but I always go back to nature in working out my poultry problems. I have laid out in the dirt, up in the hay mow and under the bushes by the hour to see what the old hen, who stole her nest, does with the chicks. I don't suppose there is a farmer's wife here but what has said that it takes the old hen that stole her nest to bring up a bunch of fine chicks. She steals her nest and you don't know how many she hatched; you don't know how many eggs she had in that nest. She usually sits on the nest until they begin to hatch, and when the chicks begin to tumble out she starts out. Those that are not able to follow she leaves. She believes in the survival of the fittest. Does she feed them? Not at all. They are way down in the meadow or the hay mow, and she will be there a week before you find her. When she starts out, what happens? Nature has prepared for the care of that chick with the yolk of the egg. The old hen may find an insect or a worm which supplies some animal protein. She makes them exercise for what they get. The further they go the stronger they get, and finally they will show up around the house when they are about a week old, and you will say, "My, what a bunch of fine chicks."

This yeast and cod liver oil is new. I don't think the college men know any more about it than the practical poultry man. We may find out that we can get the same results with one-fourth of the amount we are using now. We do know what we are doing right now, and we are getting results, and that is the answer.

VENTILATING AND BROODING.

Now as to ventilation: None of us use enough common sense in our poultry business. We get a theory and we get all excited and worked up over it. For instance, I can show you a hen house in Wisconsin; I thought that farmer was the wisest man I ever knew of on ventilation. Every year I go up there and he tells me "I have got it this year. Come out here, I want to show you something." And his hen house looks like a crazy quilt from being patched up with new ideas. Every year he thinks he has it.

In regard to brooding: there is nothing complicated about brooding chicks. A lot of people wonder why they lose so many chicks. I think one of the big successes of the baby chick industry is because they are handled in large numbers, shipped by mail, etc. By this method the chicks can't get anything to eat until they are about 48 hours old, and the next answer is that the buyer is buying them in large quantities. He knows he has to have larger brooders, larger houses, which means he has more overhead air space, and that requires more ventilation. Take out old brooders? They had a lamp in one end of a small, low box affair. We used to stick a hundred chicks in there, and what happened? We know that bad air goes to the bottom. These little chicks huddled together in that foul atmosphere, and it is no wonder that you find them dead in the morning. It merely meant the survival of the fittest. Those that were able to withstand our abuse came through all right. The weaklings were crowded out, smothered and died. My idea is to give them a nice, warm, soft place to nestle at night in a brood coop that has plenty of fresh air without drafts. The floor is covered with about four inches of fresh dirt as contact with the soil is essential. A little cut alfalfa or chaff from the barn loft is placed around the hover for a resting place. Don't feed them too soon or too much, and don't give them cold water to drink. Keep the place clean and disinfected. I am a crank on disinfection. You generally smell carbolic acid around my chicken house. I don't have any sick chicken, because I take proper care of them. I paint my house with a mixture of carbolic acid and kerosene oil.

Q. Do you feed much sand?

A. Do you mean to the baby chicks?

Q. Yes,—especially the first twenty-four hours?

A. I sometimes sprinkle a little on the board with the oat meal or if I have a little fine chick grit I give them a little of that.

Q. Who pays for the inspector?

A. As a rule the flock owner pays it. It cost ten dollars a day and expenses for the inspector. If you have several neighbors close together, it would be well to work with one another, because an inspector can cull about six or seven hundred chickens a day.

Q. What kind of a brooder stove do you prefer, oil or coal?

A. I am using oil now, but if I was brooding all winter I would use coal. My objection to coal is that you can't reduce the heat on warm days as well as you can an oil stove. If you let your coal fire out on a warm day and build a fresh fire at night, a new fire is always hotter and might be too hot. An oil burner is much easier regulated.

In conclusion let me say that I thank you for your attention, and any time I can be of service to you, let me hear from you, and any time you come around Chicago come over to Glen Ellyn and look over our egg-laying contest.

I thank you. [Applause.]

CHAIRMAN FRANK I. MANN: There is no doubt but what Mr. Hale knows something about the chicken business.

MR. D. E. DALE: I am just informed by an agent of the Department of Agriculture of the Illinois Central that if any of you want to have your flocks culled, just write them to that effect, if you live on the Illinois Central, and they will be glad to do this for you without charge. [Applause.]

CHAIRMAN FRANK I. MANN: We have with us another man who knows his business. Prof. Blair was to have been here today, but it was impossible for him to some, so in his stead he has sent Dr. Ruth. I am sure his talk will be very interesting, and I take pleasure in introducing Dr. Ruth.

FRUIT IN ILLINOIS.

PROF. J. C. BLAIR, *University of Illinois.*

LADIES AND GENTLEMEN, MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: Professor Blair is very sorry that he cannot be with you this morning. He is unable to be here because of the death of Mrs. Blair's mother, but he wanted me to tell you that he would be with you in spirit. Professor Blair has prepared a paper on Fruit Growing in Illinois, which he has asked me to read. After the presentation of this paper, I shall be glad to discuss informally any problems of fruit growing that any one may care to bring up.

Prof. J. C. Blair.

Our national development, especially our economic advancement, has now reached a point where it is impossible to ignore the conditions which beset those people engaged in agriculture. Forces for good have been at work combating powers of evil with the result that those people engaged in agriculture have been placed upon an equal plane with those engaged in many other industries. Agriculture has become a paramount factor in the economic world. When the price of farm products fluctuates, the effect, whether it be upward or downward, is felt throughout the entire country. Transportation companies, manufacturers, particularly of farm implements and equipment, as well as auto manufacturers, banks and financial institutions, dealers and distributors, for their own obvious reasons, are interested and must know the estimated

production of crops, for its affects their business to a noticeable degree. The ultimate consumer, also, should know the probable production of crops in order to purchase at the lowest possible price within reason the highest grade of products for himself and family. Indeed, the business and prosperity of the country are so vitally affected by crop conditions that every person is directly or indirectly concerned. Certainly the agricultural situation is of absorbing interest to all classes of people.

We all recognize the fact, that, for several years agriculture has been, more or less, in a state of depression. A 500-million bushel shortage in the corn crop of the United States and an 18 per cent shortage in the amount of wheat available for export by the surplus producing countries of the Northern Hemisphere have temporarily helped these two industries. The prices of corn and wheat are high, but, on the other hand, the prices of the majority of farm products are below the general price level. Very few farm products are above the general price level at this time.

Twenty years ago but 40 per cent of our population lived in cities, while over 51 per cent of our population lived in cities, while over 51 per cent are now listed as urban population. Last year the per capita productions of farm products, moreover, was 4.1 per cent less than the five-year average. In the ten years from 1910 to 1920 our production increased 15 per cent and the area of land improved for farming increased but 5 per cent. In 1904, industrial production was about two and a half times agricultural production, while in 1923 it was around five or six times as much. Our growth as an industrial nation, as emphasized by these figures, is, in the long run, a factor favorable to the farmer, because it strengthens to a constantly increasing extent the demand for his products.

In 1924, according to the latest statistics, farm crops, live stock, and other products were worth 500 millions more than in 1923. This was the highest value placed on agricultural products since 1920. By the middle of 1924, as statistics indicate, the farmers' purchasing power was 94 per cent of what it was in 1913, and about 99 per cent of what it was during the five years prior to the war. Furthermore, costs of production have fallen on farms. The improvement in the position of the farmer is one of the most encouriging factors influencing the underlying trend of business.

One hears these things discussed, because they affect all sorts of people. Business and prosperity are built pretty much on faith, and within the last few months we have witnessed a remarkable rebirth of faith. The great bulk of the American public has faith in President Coolidge's ability to lead the Nation along the right course in matters of government. He recently appointed a committee to study the agricultural situation and submit a report with recommendations. This action is just one instance of the methods employed by both the State and Nation to remedy the present state of affairs. The political outlook for the next four years is settled, and this is a fundamental factor for brisk trade in all lines for the coming year.

The president of one of the largest industries in the country has made the statement that it is his feeling that we face 1925 with the clearest skies and the soundest conditions affecting agricultural, commercial, and industrial problems that we have seen in a decade. Certainly, sound and favorable conditions are now existing.

AGRICULTURE ONE OF THE OLDEST INDUSTRIES.

Agriculture is one of the very oldest industries, differing greatly from any other line of industry. Steel works, electricity, and telephones are fairly recent, while aeroplanes, the radio, etc., are products of this generation; but agriculture has been practiced since the time of the original man.

Men may amass fortunes by becoming highly efficient in one line, such as mentioned above, and easy money can be made. On the other hand, agriculture is the most varied and productive of good of all the industries, but certainly not a fertile field for amassing fortunes. Farming requires experience and a wise application of scientific knowledge and even then the returns are very modest.

The farmer is living in a new social and economic environment as compared to thirty or forty years ago. Since then, there has occurred a nation-wide redistribution of population and production, bringing new social and economic problems. We have rapidly changing social and economic conditions, developing new problems in agricultural education, or at least intensifying the need of more attention to certain of its phases. Agricultural organizations have been developed from time to time. In the early days most of them were local with little influence and no clear function except to serve as an exchange for personal opinions on questions of farm practices. Regional competition in production and marketing had not developed. At that time, marketing of agricultural products was a comparatively simple matter. Collective buying and selling was a thing little known. Industries were not segregated in large centers drawing the youth from the country. Colleges took little notice of the problems of human relations; their agricultural instruction was centered around the effort to double production. We had not learned, at that time, that the hand and brain must be trained mutually, even in matters of farming.

Now, a million and a half farmers are organized in support of the efforts of their representatives to secure national legislation, and to educate in matters of farming. Even the farm bloc has become active in national politics. Farmers are now organized for buying and selling and for the betterment of social and educational conditions.

Increase in production has been brought about by the development of better machinery of production; i. e., better plants and animals, soil conditions, methods of production and distribution, and removal of handicaps, such as pests, diseases, and so forth. Farmers' co-operative organizations for the marketing of products should be thoroughly studied by the individual as to the machinery of marketing, that is, the marketing agencies, methods, organization and efficiency as to the standardization, and with reference to special markets. The question of transportation, also, has a direct bearing upon the economic life of the farmer.

FRUIT GROWING OF RECENT DEVELOPMENT.

It must not be forgotten that Illinois is comparatively a new state, while in any country horticulture is always of more or less late development as compared with other agricultural industries, such as the production of hay, wheat, milk, and so forth. This is not only because in the past there was a tendency to class horticultural products among the luxuries, but because their production required a closer attention to detail, and because methods of control for certain serious pests had not been worked out. These facts have made fruit growing an occupation for the few rather than for the many. Economic conditions, too, compelled the average farmer to develop only those staple products which could be stored for long periods of time, or until the best markets could be reached. Hesitating to embark in horticulture of a commercial scale, the farmer failed to follow it even as an avocation; so that it naturally followed not only that grain, stock, and dairy farming until recently have been the chief agricultural industries of Illinois, but that those engaged in these pursuits have neglected, wholly or in part, the fact that horticulture is the helpmeet of agriculture. To be sure, the farmer had a fruit orchard, or a farm garden for his own supply of fruit and vegetables, but he did not often entertain the idea of growing fruit for the market. Had the farmer given more of his attention to fruit crops no doubt our horticultural development would have been more rapid and would today attract a great deal more attention. It is only recently that fruit growing has been commercialized, but from now on the growth will undoubtedly be saner and more practical. The experiences of the past and the more advanced knowledge of the industry will be put to good use. This will tend to take the risk out of fruit growing and place it upon a firmer and more established basis.

CENTERS OF FRUIT PRODUCTION IN ILLINOIS.

Illinois is located in the fruit belt of the continent, possessing a range of latitude of five and one-half degrees. This fact, together with those of

climatic and soil conditions, and the absence of large tracts of worthless land, is bound to make Illinois one of the greatest horticultural states in the Union, if we but do our part.

Home orchards and fruit gardens are widely distributed over Illinois, about 60 per cent of the farms reporting some trees. Commercially, however, fruit growing has reached its highest development in the southern half and western sections of the state where large areas of land and a favorable climate have combined to encourage the industry. Production centers around three principal locations: (1) the unglaciated hill region at the south end of the state where a spur of the Ozarks provides excellent orchard sites, in which are included Union, Johnson, Jackson, and Williamson counties; (2) the gray silt loam section on a line east of St. Louis, of which Marion, Clay, and Jasper counties are the largest producers; and (3) in a group of counties centering in and about the junction of the Illinois and Mississippi Rivers with Calhoun, Pike, and Adams counties as leading producers. Among the relatively northern counties in which commercial fruit growing assumes considerable importance are Hancock, Tazewell and Bureau.

KINDS OF FRUITS.

The apple is the most important fruit grown in Illinois. In the number of farms reporting the number of fruit trees, in total yield and valuation, and the place it fills in the diet, it far outranks all other orchard fruits. So closely does the apple production parallel the total fruit production for the state that the centers of apple shipping are indicated by the list of counties given for fruit production.

In 1924, according to estimates of the United States Department of Agriculture, the production of apples in Illinois totaled 5,292,000 bushels. This shows some 2,000,000 bushels decrease over 1923.

The varieties principally characteristic of Illinois apple growing are Jonathan, Grimes Golden, Winesap, Rome Beauty, Willow Twig, and Ben Davis. The Ben Davis, however, because of its susceptibility to all diseases, and most especially blister canker, is rapidly passing out of Illinois orchards and is not being replanted. In the Ozark section in the southern part of the state, the production of summer varieties, of which Yellow Transparent and Duchess are the leaders, is rapidly assuming paramount importance.

Peaches are grown largely in Union, Johnson and the neighboring counties. There the high local elevations afford relatively frost-free locations, and the comparatively mild winters render winter injury to wood and buds less frequent than in the northern part of the state. Marion County is the center of another important peach growing revival of interest within the last eight or ten years.

The Keiffer pear continues to be the only successful commercial variety in Illinois, Marion County again leads in production.

There are relatively few commercial cherry orchards in the state, but this fruit is widely grown in home orchards. Varieties such as Dyehouse, Montmorency and Richmond thrive in all parts of Illinois, but sweet cherries are almost uniformly a failure.

About one-fourth of all the farms in Illinois report the production of some small fruits. Of the total production, strawberries far outrank brambles and bush fruits although considerable quantities of the others are grown. The largest producing counties are Adams, Fayette, Hancock, Macon, Tazewell,Pulaski,and Union.

PROBLEMS FACING ILLINOIS FRUIT GROWERS.

Fruit growing is a business; a highly specialized type of agriculture, which cannot be run successfully by rule-of-thumb methods of procedure. The many problems that confront the grower of fruit make it essential that he shall thoroughly understand the principles involved in good orcharding and that he shall apply them wisely to the particular conditions with which he contends.

Many orchards are doomed to failure or to mediocrity of success, because they are poorly located with respect to soil and temperature conditions, or for other reasons which might easily have been avoided had good principles of orcharding been followed.

Fruit growing, even then, is more or less of an uncertainty. For instance, severe weather may wipe out completely an established orchard; or a series of poor years may use up all profits made during a previous successful year or number of years. Then too, the longevity of fruit trees is more or less indefinite. After trees are bearing there is a chance for but one crop of fruit a year, or in two years, if the trees happen to be biennial bearers. Furthermore, very often we grow apple and pear trees a dozen years before full fruitage. Again, the apple harvested in October must be held in storage for consumption possibly as late as April or May for suitable market. A thorough knowledge of the value and capabilities of the soil must be acquired. The problems attending efficient marketing of fruit are many, and necessary readjustments must be made from time to time for successful marketing. Fancy products, such as fruits, demand special markets. The package should be suitable to the market, and certain varieties available to certain markets. These problems are only a very few of the many that face the fruit grower. Is there any wonder that farmers are so slow in taking up this phase of farming as an industry? But, when these and similar problems have been carefully studied by investigators, and results made known to the public, the seas will have been smoothed and the number of fruit growers increased. For many years the state experiment station has given careful and special study to the problems of production and distribution, and now that the problems of consumption have come to the front they will be given the same degree of careful and thorough attention. I want now to give you just a few of the ways in which the Department of Horticulture is aiding the fruit grower with his problems.

THE DEPARTMENT'S AID TO FRUIT GROWING.

It is the function of the fruit grower to raise fruits. It is the function of the Department of Horticulture, through its experiments, to minimize and stabilize the risks. Its aims are to discover and instruct but not to control or direct any person's actions. It aims to point out to constituents the opportunities which the horticulture of Illinois offers, and teach them how to take advantage of those opportunities. It is not the function of the Department to conduct or interfere in any way with the fruit growers' business.

The business of farming particularly fruit farming, demands the very highest scientific and technical training to be successful. It is our desire to co-ordinate theory and practice with a liberal education, so that in the graduate of the Department of Horticulture can be found not only a trained horticulturist, but aslo the well-equipped leadership so necessary to a community that is building itself religiously, socially and economically.

It is not only through the training of efficient horticulturists that the Department is capable of aiding the grower of fruit, but also through the research work and the extension service. This is an age of research, and the science of horticulture has grown out of experimentation. Research has demonstrated its value by the discoveries (the benefits) that can be traced to it.

Through the extension service the experiment station is able to help directly a large number of fruit growers with their problems. Extension tends to give wider application to the results of investigation; it adds to the research efforts, increases the demands upon it, and ultimately gives it wider appreciation. The practical man points out to the researcher the most important problems for solution.

Among the most pressing problems in fruit production in Illinois are the control of insect and fungous pests, and the regulation of the supply of plant food. Illinois apple growers pack one million barrels of apples, more or less, each year in addition to large quantities of bulk fruit. Yet, Illinois growers generally have been slow to take up any new method de-

signed to control insects or fungi without demonstration. Investigations of the Department have shown that spraying with the proper materials at the proper time will save a large percentage of fruit from certain pests, and that certain cultural practices will be most beneficial to production. Where we have demonstrated the most advantageous procedure, growers have been quick to follow our recommendations.

Repeated experiments in many orchards in different parts of Illinois have been conducted on methods of control of apple scab. Apple scab is perhaps the most serious apple disease, taking the heaviest toll in orchards. The Department has found that sprays applied according to the directions derived from the conclusions of our spraying experiments will save from 50 per cent to 95 per cent of the fruit from this disease. Records show that there are certain varieties of apples that are less susceptible to scab; such as Jonathan, Grimes, Benoni, Minkler, Duchess, Stayman, Wealthy, Yellow Transparent, and others.

When apple blotch first came to the notice of the fruit growers of Illinois, they attempted control by spraying as for scab. Some of the largest growers turned to the Station for help with the problem, and after detailed laboratory and field investigations were made a spray program was devised which gave complete commercial control of blotch even on the most susceptible varieties, such as Benoni and Duchess. This schedule was reported by a grower in Johnson County as "working perfectly in a badly infested Duchess orchard."

One of the most important problems of the horticulturist has been spray injury. Experiments show that certain spray solutions are decidedly injurious to the fruit of sensitive varieties, often causing Bordeaux, and lime sulfur injury. For instance, certain varieties are resistant to Bordeaux injury, in which case this material may be applied with greater assurance of control, while the schedule on varieties subject to Bordeaux injury calls for lime sulfur for the early sprays.

Illinois peach orchards are in danger of being overrun with San Jose scale unless a stringent spray schedule is followed. The trouble recently has been due to a late brood of scale which hatched late, and favored by the mild autumn weather grew to a size enabling them to survive the winter. Oil emulsion, thoroughly applied, has solved the problem very satisfactorily.

The invasions of bacterial shot hole, one of the worst diseases attacking the peach orchard, have caused widespread interest in fertilization methods os a means of control. Experiments have definitely proved that quick acting fertilizers are to be avoided in the early growing season, as a slow even growth produces a healthy tree and one less likely to lose its foliage later. The best fertilizer seems to be manure. If nitrate is used, it should be applied at intervals of three or four weeks, making at least three applications, the first being made about the middle of May.

Extensive orchard fertilizer experiments have been conducted by the Department. It has been shown that in apple orchards only nitrogenous fertilizers have any appreciable effect. Nitrogen may be added by growing leguminous cover crops, adding manure, or by sodium nitrate, or ammonium sulfate. Where possible nitrogen should be drawn from the air (by legumes), but in many cases the use of commercial forms of nitrogen is justifiable.

The Department has demonstrated to fruit growers widely accepted methods of pruning. It has also instituted several pruning and fertilizer experiments which deal particularly with the formation of the frame work and the relation of pruning and nitrogenous fertilization to each other and to production. Comparisons are made between various degrees of thinning young trees, different degrees of severity of pruning, the merits of one and two-year-old trees, as well as many other points of importance. The California system of pruning has been found to be a sound one for Illinois conditions and is being carried out in several orchards.

In co-operation with the Department of Farm Organization and Management we are working on a cost accounting study for orchardists. The records should show not only costs, but susceptibility of certain varieties to certain diseases, the particular slopes subject to spring frosts, and so forth. The general object being to point out the most remunerative practices.

The above-mentioned studies on pomes are only a few of the problems that are being conducted by the Department. Some thirty-four projects on pome fruits alone are being carried on, many of which take up from four to ten different phases of the problem.

SMALL FRUITS AND GRAPES.

The larger part of small fruits grown in Illinois are to be found in home gardens, but the success of a few extensive plantations in the state testify as to the possible profits in the industry, commercially. In southern Illinois, however, commercial small fruit production has decreased to almost nothing in the last twenty years, according to a survey made by the Department. This has occurred because of an increasing prevalence of diseases, the wrong choice of varieties, and poor cultured methods. The counties in Illinois that are most concerned with the growing of small fruits for market are Adams, Fayette, Hancock, Macon, Pulaski, Tazewell, and Union.

Small fruits and grapes furnish an attractive field for experimentation, because of the lack of much scientific information about them, and because results may be obtained more quickly than from the tree fruits. The Department is conducting a number of experiments in an attempt to improve conditions in the small fruit industry, such as in the control of diseases, improvement of cultural methods, testing of varieties, and the improvement of cultural methods, testing of varieties, and the storage behavior of different varieties.

A way has been found to successfully control raspberry anthracnose, a very common disease, by the use of sprays properly made and applied. We are also recommending a definite spray program for small fruits and grapes which will control grape root worm, grape black rot, strawberry leaf spot and leaf roller, and the leaf spots of certain bush fruits, all of which diseases hinder the production of small fruits. For such raspberry diseases as mosaic and crown gall, control measures, such as roguing of plantations where only partially infected, or complete renovation and reestablishment with disease-free stock, are being advocated and followed by several of the most progressive growers.

Variety studies have been made at many times and places by many people, but new varieties are perpertually being introduced and old ones fail for reasons not noted by the earlier observers. Producers and consumers are more and more critical of quality, beauty, size, adaptation to particular purposes and regions, resistance to disease and insects, et cetera. It is necessary to continue variety studies constantly, therefore, and this is one of the regular projects of the Department. Several Farm Advisers in different sections of the state are co-operating with the Department in order to advise more specifically as to varieties for their sections.

Pruning experiments with small fruits and grapes particularly were undertaken to clear up the confusion in the minds and practices of fruit growers and experimental pomologists regarding the subject, and to provent the all too frequently costly results of ignorance of the pruning system. Demonstrational work was conducted at several vineyards in the state, with outstanding results. Several large growers are now following our recommendations, finding that they secure increased yields of higher quality fruit.

PRESENT-DAY PROBLEM.

The above-mentioned problems have to do mainly with the production of fruit, but the fruit grower's greatest present-day problem is how to greatly increase consumption of his fruit and place it within the reach of the consumer and the consumer's pocketbook.

In the problem of increasing consumption the fruit grower will find that there are many angles to consider. He should let the public know the value of fruit as a diet. People should be taught the value of varieties for certain purposes. Then, there are the problems of standardization. There is nothing more demoralizing to market conditions and prices than the movement of large quantities of products that are poorly graded, in bad condition, or otherwise undesirable. Careful grading to standard specifications, guaranteed by thorough, competent inspection provides a stable basis for sale. Standardization reduces waste and losses when culls and other unmarketable produce are kept off the distant markets.

In recent years co-operative marketing organizations have played, and are playing, an important part in helping the fruit grower locate the right market for his fruit, and the increased returns have stimulated the planting of fruit trees.

And so, as in other lines, some of the problems confronting the fruit grower of today are those of organization, standardization, merchandizatin, and advertising. These are problems requiring careful thought, hard work, and a liberal expenditure of money. The Department is helping with these problems in so far as is possible.

THE MISSION OF FRUIT GROWING.

Horticulture is a most important factor in the development of any country. It has an important mission everywhere, but in no country is man's duty more clearly recognized, or more needed, than in the broad open country of the Mississippi Valley. The intelligence, the foresight, the hard work required for the proper development of the horticultural plantation, whether it be the fruit garden, the vegetable garden, or the ornamental areas, are not equalled by any other occupation or profession in which men engage.

In all horticultural service, we cannot fail to recognize, or in any way to neglect the fact that we are always dependent upon the mental productivity of men, and men alone. In consequence, we must provided adequately for a continuous supply of well-trained workers in horticulture. This we are attempting to do at the University of Illinois. Through this effort and through these men there will soon be developed in Illinois a fruit country surpassing most and excelled by none.

I thank you. [Applause.]

CHAIRMAN FRANK I. MANN: I would like to have Senator Dunlap give us a few words on this subject.

SENATOR DUNLAP: Ladies and gentlemen.

I don't know why the President called on me at this time to say a few words. He may have a reason. However, I do want to say that fruit growing has become a specialty, and it has occurred to me that it would be better to have the farmers come to my orchard and buy my apples than grow them themselves. My neighbors say that they can better afford to buy apples than to raise them. On the other hand, it would be a fine thing for the farmers to grow their own fruits, but as long as we have about fifty per cent of the farms occupied by tenants, you see there is considerable difficulty in doing that. There is no question but what apples are one of the healthiest foods we have and will do more for health than anything else. Apples are the finest things in the world not only as desirable for food, but they are actually desirable as health promoters. Even the pomace from our cider mills is considered a wonderful food for stock feeding. They are now drying this pomace in steam dryers, which dries it out as fast as it is made, and it is sweetened before it sours, and I look for the time to come that our poultry raisers and our stock raisers, instead of buying this fattening product that is supposed to do so much good and which really amounts to very little will find that dry pomace will be one of the best things they can use to keep their stock in a healthy condition.

I have been interested in the Farmers' Institute for many years; I don't believe there have been many of these conventions but what I have

been present, and I am glad to say, I was a member of the Legislature when the bill was passed creating this Farmers' Institute.

I thank you. [Applause.]

CHAIRMAN FRANK I. MANN: Is the Committee on Resolutions ready to report? Mr. Abbott, please present the report.

MR. A. N. ABBOTT. Mr. Chairman and gentlemen.

The Committee on Resolutions beg leave to submit the following resolutions:

CHILD LABOR AMENDMENT.

RESOLVED: That we express ourselves as unalterably opposed to the Twentieth Amendment to the Constitution of the United States, believing as we do that the youth of America are handicapped more by a lack of work and responsibility than by overwork, and that child labor abuses may be more practically and adequately controlled by the state laws than by federal legislation.

GASOLINE TAX.

RESOLVED: That we are opposed to the proposed tax on gasoline and to all other direct taxation on the necessities of life.

RURAL POLICY.

WHEREAS, the rural and small town districts are now without adequate police protection, and open to the depredations of robbers, criminals and lawbreakers, and

WHEREAS, with our ever-increasing mileage of paved roads, reckless driving, speeding and damage to the pavement by heavy trucks is assuming alarming propositions;

BE IT RESOLVED that we re-affirm our former position and petition the Fifty-Fourth General Assembly, now in session, to pass a bill providing for a well trained state police, empowered to enforce the laws of the state.

TAX ON PASSENGER AND TRUCK LINES.

RESOLVED: That we are in favor of imposing an equitable and just tax upon all passenger and truck lines operating as public carriers on Illinois paved roads.

REVENUE AMENDMENT.

RESOLVED: That recognizing the limitations imposed upon the legislature by the present constitution preventing adequate legislation to equalize the tax burden, we favor the adoption of such an amendment to said constitution as will enable the legislature to pass such laws as will equitably distribute said burden.

"T. B." LEGISLATION.

RESOLVED: That we favor such action and appropriations by the General Assembly as will further as rapidly as possible the eradication of bovine tuberculosis in Illinois, and that we favor a state law preventing the sale of dairy products from untested animals after January 1, 1930.

GAME LAWS.

RESOLVED: That we favor a zoning system for the protection of wild life conforming with the three divisions of the state as recognized by the Department of Agriculture, and that we are opposed to a closed season on rabbits.

COMMUNITY HIGH SCHOOLS.

RESOLVED: That we favor the amendment of the Community High School Act to prevent the voting in and taxing of rural lands and rural property by urban centers located in such sections, without the consent of a majority of the voters residing in such rural centers outside of the urban centers of populations; and that the practical means be provided rural centers already in such districts to sever themselves from such injust burdens.

APPRECIATION.

RESOLVED: That we express to Mr. D. M. Marlin, retiring director from the twenty-four district, our deep and sincere appreciation of his many years of unselfish service to Illinois agriculture as a member of the Board of Directors of the Illinois State Farmers' Institute, two years as vice president and two terms as president of the Board, and that we extend to him at this time our most hearty greetings and good wishes.

We, the delegates to the Thirtieth Annual Session of the Illinois State Farmers' Institute, convened at Paris, Illinois February 18, 19 and 20, 1925, hereby express our hearty thanks and appreciation for the generous and courteous treatment afforded the State Institute by the officers and members of the Edgar County Farm Bureau and the Edgar County Farmers' Institute, the Paris Chamber of Commerce, members of the various local committees, newspapers and churches, the Boy Scouts, and all who contributed to the program and the entertainment of delegates and visitors, and we especially appreciate the cordial hospitality and active co-operation extended by all the people of Paris and Edgar County in making the Thirtieth Annual session of the Illinois Farmers' Institute an outstanding success.

Respectfully submitted,

A. N. ABBOTT, *Chairman*
GEORGE F. TULLOCK
WILLIAM WEBB
E. W. BURROUGHS
FRED L. PETTY
E. G. THEIM
FRANK HAYNES.

Here is a resolution which was presented to us this morning which I will read:

FREIGHT REDUCTION.

"Believing that an adequate reduction in freight rates is more important than the proposed removal of the surcharge on Pullman fares now pending in the United States Congress, we are opposed to the removal of the surcharge at this time.

CHAIRMAN FRANK I. MANN: You have heard the report of the Committee on Resolutions. What is your pleasure, gentlemen?

SENATOR DUNLAP: I move the adoption of the resolutions as a whole.

MR. A. N. ABBOTT: I second the motion.

The motion was carried.

CHAIRMAN FRANK I. MANN. That concludes our morning session. We will adjourn until 1:30 o'clock this afternoon.

FRIDAY AFTERNOON SESSION.

February 20, 1925, 1:30 o'Clock P. M.

RALPH ALLEN, *President, Illinois Farmers' Institute*, Presiding.

PRESIDENT ALLEN. We will begin our afternoon program, ladies and gentlemen, with an organ solo by Mrs. Gordon.

Organ Solo.....Mrs. Gordon

PRESIDENT ALLEN: I believe Mr. Gross, of the Boy Scouts, would like to say a few words.

MR. GROSS: Ladies and gentlemen: I am not on the program and was not expecting to appear before this august audience at all, but just a little bit ago there was handed me an envelope containing a tidy little sum for use of the Boy Scout movement. As Secretary of that organization I want to thank you for the little offering you have given. While you have been in Paris, I want to assure you that every organization of every kind has tried to do its bit in order to make your stay pleasant and worth while. As you probably know, it is the motto of the Boy Scouts to do a good turn

daily; we have tried to do that. We have been handicapped somewhat during our stay for the reason that most of the boys are of school age, and consequently are attending school during the day.

Let me again thank you for your kindness and rest assured that our greatest pay is in the service rendered you.

I thank you. [Applause.]

PRESIDENT ALLEN: The printed reports of the Annual Meeting held at Dixon have been printed, and you will find copies of them in the rear of the church. Be sure and take a copy of both the Institute and the Household Science Department with you. It might be well to take a copy along for your neighbor.

Now I am going to ask Mrs. Mann to introduce the lady speaker of the afternoon.

MRS. LENA S. MANN: I think a few of you went down in the basement of this church a while ago and had a big dinner, and you may know that it is very difficult to talk after you have eaten a big dinner. I heard a story of a minister who was holding a series of revival meetings, and he told his hostess he couldn't eat his supper before he would preach his sermon; that he couldn't talk when his stomach was full. So she told him she would get supper for him after the meeting. Well, after they came home from church she cooked him a hot supper; the minister ate it and then went into his room. After he was gone he heard the husband talking to the wife and the husband said, "Well, what kind of a sermon did he preach?" And the wife said, "Oh, he might just as well have "et" before he preached." [Laughter.]

I know you are going to like the next speaker, and I know she needs no apology for anything she is going to say, whether she has eaten a big dinner or not. Mrs. McMurray has charge of the Household Department of a school at Maryville, Tennessee, but she formerly resided in Illinois. She is going to talk to us this afternoon about the equal chance for boys and girls. Mrs. McMurray.

AN EQUAL CHANCE.

MRS. KATHRYN R. MCMURRAY, *Maryville College, Tennessee.*

LADIES AND GENTLEMEN: I wonder if you can realize what joy it is for me to come back and see all of your familiar faces, or, many of the familiar faces of the people I worked with a few years ago. I can't see a face without thinking of something that happened when I was with the particular person who owns that face. I am reminded of a story right now, which I would like to relate. One of my first trips in Illinois in connection with institute work landed me in a little southern home hotel. The evening meeting lasted until late, and in order to get a train to the next place we had to leave at four o'clock in the morning. The landlady at this "Home" hotel which, by the way lacks both the comforts of home and hotel, had no alarm clock, but she asured us that she could awaken any time she wanted to by setting her mind on it and she promised to call us at 3:30 in the morning. Well, we went to bed with the confidence of inexperience and slept the sleep of the weary. Sometime after I had been in bed.—it seemed just a few minutes,—I awoke with a start, feeling that something was wrong and struck a match to light my little lamp and look at my watch, and what do you suppose: it was ten minutes before train time! I jumped up and grabbing my negligee started to run across the hall to call the men who were traveling in the same party, when I almost ran into what I thought was the God-

Mrs. Kathryne McMurray.

dess of Liberty, holding aloft her torch, but on second thought I decided it was not; for then I remembered that the Goddess did not wear pajamas. Indeed were she to fall from her pedestal and be swallowed by the hungry ocean she could not disappear more quickly than did this nice man who started to call me. To make a long story short, we caught our train.

I see a face smiling at me. I wonder if its owner was the one who was in another hotel when we had a peculiar experience. The German proprietor was to awaken a man for an early train, and he forgot the room he was in; so early the next morning he started down one side of the long hall, knocking on each door as he passed, saying, "Vas you de man dat vanted to take dat 3:30 train?" The first party he awakened said "No." And the proprietor's answer was, "Vell, I thought not." At the next door the same thing happened and so he awakened everybody down on one side of the hall, started back the other way, when about half way up he struck the right party, and when the party answered in the affirmative he said, "Vell, I thought so." [Laughter.]

I could tell you of dozens of things but I am not going to. Mr. Mann, didn't you use to have some silage corn that you carried along with you? While Mr. Mann had his silage corn I had one bag containing my clothes and another my utensils, which Mr. Mann called my summer kitchen. I wore his silage corn as a corsage and he carried my kitchen. Mr. and Mrs. Mann gave us a wonderful thrill one time when they sent us a Christmas turkey we were not expecting; and there is Mrs. Brock, she taught me to eat sauer kraut and mashed potatoes. I remember something else too. I remember when Mrs. Mann was not Mrs. Mann. [Laughter.] I remember at a state meeting at Sterling when we felt that this courtship really began. I did not know that Mr. Mann was interested in this charming young matron, but I saw he was commencing to take notice of her, and several of us in the party were very much delighted; so when we started away from the Sterling meeting we thought we would all get together and get away from them so we would not bother them on the road home, and we did. After we were seated in the front of the car and they in the back we patted ourselves on our shoulders thinking how skillful we had managed to evade them, but as I think back over that, I don't remember that we had any troubles in getting away from them, and I still wonder if we did all the evading.

While coming back to Illinois is one of the happiest days in my life, I want to tell you that leaving it was just the opposite kind of a day. We left the old state, we left the people, we left the great big fields of corn and the black soil, we left the cattle and everything with you, and it seemed to us that no state could ever again make us so happy. As the train taking us to our new home in Tennessee wound through the hills or around the curves, as it cared to do, it seemed that something inside of me was pulling back, and the further we went from Illinois the harder that thing pulled. Our last lap of the journey was made in the early dusk. The conductor came in and called out the train stops, and we peered through the windows but we couldn't see a thing. We reached our destination in a drizzling rain; we hadn't had any supper. A man met us at the station and took us out to a great, big, empty dormitory where the mosquitoes led us a merry dance the whole night long. Illinois skies were never bluer than were the McMurrays that first night in Tennessee. The next morning, however, when we awoke and saw the mountains just barely outlined in the mist of early dawn, a little different feeling stole over us. The more we saw of those mountains the more we longed for them; the more we know of the people with their sincere hospitality, the more we knew of the mountaineers with their frankness and simplicity, the more we loved Tennessee, and now while we love Illinois no less at all, we have learned to do as Cummings

said "we love our native state whether we were born there or not," and with the natives we can sing:

"Oh! Tennessee, sweet Tennessee,
The land of all this world to me
I stand upon thy mountains high,
and hold communion with the sky;
if heaven on earth could only be,
t'would surely be in Tennessee."

So, I, an adopted mountaineer, bring you greetings from Tennessee, the state next to heaven. I don't want you to think that I am like the wife of the colored man who was seeking a divorce. The judge says, "Rastus, what has your wife done? Why do you want a divorce?" Rastus says, "Oh, my wife, she just talk and talk and talk." And the judge says, "Well, Rastus, what does she talk about?" And Rastus says, "Oh, judge, she don't say." [Laughter.] You may think I am that kind, but I want you to know that I have something to say and I am going to say it right now.

HUMAN WASTE.

Last fall when I was hunting some inexpensive material for Christmas dolls, someone suggested that the waste from a nearby hosiery mill might furnish what I wanted. I was surprised, when I investigated to find that they did not have enough waste to meet my small need. I thought that was queer and I asked the manager the percentage of first, seconds thirds and waste. He did not know on the spur of the moment, but he said he would look it up and send me word. After careful investigation he reported that 90 per cent of their output was firsts, of the very finest quality, about 5 per cent were seconds, 2½ per cent thirds and about 2½ per cent waste. I thought that was a pretty good record. A few weeks later I went to Tallahoma, Tenn., and visited a vocational school for girls. I didn't know anything about this school; I just knew that the committee was being entertained there, and when the ninety-seven girls, most all dressed up in their white clothes, attractive young girls from 12 years up to 21 showed us their rooms and served us a most delicious luncheon. I was delighted with them. A little bit later I was horrified when someone said, "Mrs. McMurray, do you know why these girls are here?" And I said, "No. Why?" She said, "Every girl here is here because of her immorality, not because of one mistake or two mistakes, but because she is chronically immoral." I was appalled to think of these girls, who were so attractive in appearance, as human waste, not seconds or even thirds but absolutely waste. As long as they were under the controlling influence of this school they were harmless waste, but when they are removed from its influence, as they must be at 21, and set adrift in the world, then what about them? They are not harmless then; they are very menacing, for these girls reproduce one child after another, without any thought whatever of assuming responsibility for them. Indeed they are no longer harmless waste; they are a serious menace. These children become the charges of the government, must be kept by them, and they in turn produce others of their kind. And, I thought of the awful endless pity of it! My heart ached for those girls who looked so attractive, who were attractive; who had the mature development physically of any individual, but who were mentally the age of a child. It is said that one family by the name of Tate has cost the government $2,100,000. After this enlightening experience I was not surprised.

Recently I read an article by Albert Edward Wiggin, a scientific writer, who in addressing the Philadelphia Clinical Association, made the assertion that modern man is declining mentally and physically, and he took up the subject saying that the average mentality of men called in the world war was that of a thirteen year old child, and that their physical condition was appalling. Then he added in an unconcerned way, what most of us already knew, that people of low intelligence are producing much more rapidly than people of higher intelligence; he continued with this

startling statement that a thousand university graduates in six generations produce only fifty more people than themselves, while a thousand morons, people of low intelligence, in the same time, produce 800,000 more than themselves.

FOOLING OURSELVES.

Now, what are you going to do about it? We have always known that the family of the farmer had more children than the family of the college professor, but we thought he could better afford them and anyway the stock was usually just as desirable, but when we considered the large families of laborers of low intelligence we were appalled. Neither could we believe that the college graduate, the university boy and girl, are so falling down on their job, and to satisfy myself I just figured up in our own faculty. Not counting the younger teachers who had only taught a few years, I found that fifty-four mature men and women had produced in one generation only forty-four, not even replaced themselves. And likely what is true in our faculty is true in others. Now, what are we going to do about it? Where in the world would my hosiery friend be if his waste were in excess of his first and standard stock? Where would the cattle man be if the inferior stock was allowed to produce twice as many calves as the registered stock?

Here we have emphasized our great inventions, our high powered machinery, our delicate apparatus and all of these wonderful discoveries, and we have patted ourselves on the back with what we have done along those lines, and all the time we have been putting our energies on them we have neglected posterity. I am wondering if we haven't sort of played a joke on ourselves.

The other day a woman came down from the mountains away back of Maryville, who was going away on the train for the first time. She went into the depot and said "I want a ticket." And the ticket agent said, "Where to?" She says, "It is none of your business." And he said, "Well, madam, I can't sell you a ticket if I don't know where you are going." And she said, "Well, if you must know, I am going to Knoxville." So he gave her a ticket to Knoxville, and a little bit later as he looked out of the window he saw the woman on a train headed in the other direction. He ran to the door, but he didn't have time to say anything to the conductor for as the train was pulling out she stuck her head out of the window and called: "Ah, ha, I fooled you. I am going to Calderwood." [Laughter.]

I wonder if we are not fooling ourselves. We think we are advancing, going forward with all these wonderful inventions of our's when maybe we are going backwards in the stock, in the intelligence that we are leaving for the future.

What good will all these things do, these high powered machines and different things that have been invented recently, if they fall into the hands of posterity of thirteen-year old intelligence? Don't you think it is high time that we emphasize a little bit more the stock of the future, the children of the future?

A writer in a very recent magazine article said that he would like to place above the door of every educational institution an inscription to this effect: "An equal chance for every boy or girl." What good would that do? We might give them equal educational opportunities, but after a child is born it is long too late to commence talking about an equal chance. We can never give an equal chance until we can give an equal capacity for receiving. Haven't you seen one boy in a school room become a scholar, while right next to him a boy under the same instructors, a boy with the same amount of application, flunk all of his studies? There was an unequal capacity for receiving between the two boys. Haven't you seen one business man climb and rise, while the other failed? Yes, because they had unequal capacities. Imagine two boy Scouts going on a hike through the country, meeting a farmer, who would say, "Well, boys, when you get to the orchard go in and help yourselves; take all the apples you want." That sounds like an equal chance, but it was not, for tucked away under

one boy's arm was hidden receiving capacity; he had a gunny sack while the other was empty handed. They had equal opportunity but not equal receiving capacity. A child can never have an equal chance with his brothers until he has equal receiving and absorbing capacity, and the only possible way to give that to children is to commence in the training of their great-great-grand parents, and then at some Institute seventy-five years from now you may talk about an equal chance and be more nearly right.

As seeds produce their kind, as cattle produce their kind, so human parents produce their kind. A cattle man does not go around buying up any kind of stock trying to build up his herd. He looks out for the parents in that stock and makes sure that they are all right. You all remember the family of Ida Jerke, the great German criminal, whose descendents numbered over eight hundred, and everyone of those descendants was immoral, a drunkard or a criminal; and you remember in comparison with that illustration the descendants of Jonathan Edwards. He was a great, good man, and his children and descendants like him were all worthy of admiration. Like parent, like child, is a true adage, and if we are going to have a worth while posterity we must commence now training the girls for motherhood and the boy for fatherhood!

Why has the college girl fallen down on her job? I think it is her fault more than it is the fault of the boy, because a girl can lead the boy into matrimony if she wants to. Why doesn't she go into the home? Most of the high schools and a constantly increasing number of colleges and universities are putting in household science departments and courses.

TRAINING FOR MOTHERHOOD.

Just the other day the state supervisor came to Maryville to see if we were keeping up with the requirements for colleges and universities. She went over our course and she said "Where do you teach the moral, the intellectual and the physical training of the child up to school age?" Then I told her. She said "Where are you handling the family money?" I showed her that course. She said "Where do you teach the relation of different members of the family to each other?" I told her about that course. She said "Where do you teach social hygiene?" And I told her all about that course, a course that we would not have talked about a few years ago because of our false modesty. There is nothing immodest in God's plan of life and the great trouble is that we haven't made it plain to the children. So, we are giving a course, teaching the girls how to choose the fathers of their children. Why shouldn't that be so? They should not go into it haphazardly. Why aren't the girls assuming motherhood? The courses are all right. They are getting more training than their mothers ever had, yet they are not going into the homes. Something is wrong. This is it. Who is making them want to be home makers? Who is? Long ago before we had our home economics in the schools, the mothers taught the girls in the homes. The mother loved her home and she gave the girl her high ideals and the inspiration to be a home maker and a mother. Now, since we have home economics in our institutions the teacher does it and the mother does not. The teacher has acquired her training from another teacher before her; she knows the theory but she has not had the thrills of motherhood and she teaches her pupils with an idea of them teaching somebody else. She does not know the joys of home making and motherhood. So she only teaches them to teach.

Now, I think we are making a big mistake in allowing unmarried women to teach. That may be startling to you. The cattle man does not take the old stock for his breeding, does he? No, he takes the young stock that is in the prime of life. Why then do we put our splendid young girls into a school room when they should be in the home? I would say no unmarried woman should teach who could find a good husband. After the young woman has gone into the home and raised her family, and her family are where she can take care of them without being with them all the time,

then let her, with her experience and maturity, go into the school room, and she will make a better school teacher for having had that experience, and she will have been a better mother because of her youth.

During the war many girls were out in the business world. I don't object if girls go into business, but I want the girls to hear this: while she may take a man's place in business, a man can never take her place in the home and if she does not do her work in the home it is not going to be done. Intelligent girls are not doing what they ought to and intelligent parents are not teaching them what they ought to, because we have all been rather proud of our girls who hold a man's job. The old fashioned grand mother has given way to the new fashioned grand mother, and the new fashioned grand mother is not any poorer a grand mother because she has had a college education. It doesn't hurt her any, there is the trouble: while the children and grand children love to come home for Christmas, just as much as ever children did, there are not enough of them to come.

I have in mind three of our own college girls who commenced to teach. They all have very impatient young men waiting, but the girls continue to teach. I said to one of them, a girl named Stella, "Why don't you get married?" She said, "I am afraid, and the longer I wait the more I am afraid." She said, "I am having such a glorious time, I don't want to give up these thrills and go to a routine of drudgery." I said, "You don't know what you are talking about, Stella. The little flutter you have over a box of candy or a dance is nothing compared with the real thrills of motherhood." I said, "Never in the world will you know what a real thrill is until that first baby is laid in your arms, and from then on you will have thrills that are worth more than money can buy." I know just how this girl felt. She was making her own money, and it is hard to give up your own salary for a smaller one, with a man thrown in. [Laughter.]

I went through this same stage with my own daughter.

The longer she waited to get married the more she disliked to give up her so-called freedom. Well, she finally married, and after a year of married life wrote this in one of her letters: "Mother, I never knew anyone could be so happy and contented." She used to look on thrills and flutters with such satisfaction, but when her baby boy came she wrote again and she said "Mother, I never in my life was so thrilled and excited," and in every letter that comes back I hear the same thing "Oh, mother, I am so glad you made me do this and that. It is going to make me a better mother." That is the sweet refrain that runs through every one of her letters. She finally has caught the purpose for which she was created, and until her family is raised her one big object in life is to be that better mother. Why can't we teach girls that way? How many of us have held up to our girls the nobility of motherhood and home?

At a gathering of editors recently in the State of Ohio, one of the editors of one of the largest dailies there said, "Parenthood is only incidental." Now, ladies and gentlemen, the time has come when it is up to thinking people to make parenthood more incidental. If we are going to keep the American home the sacred institution its name implies, we have got to get busy now. There are two obvious things to do. The first one is somehow or other to curtail the rapid reproduction of people below a certain mental capacity. I don't know how it is going to be done, but it is not right to spend public money raising subnormal children when that money could be used for educating normal children. The main thing to be done, probably, is to segregate the sexes until the generations die off; that would be an easy way; may be by some simple operation, production could be curtailed. I don't know. The other thing that has to be done is to get the girl into home making, first training her for it. Why can't we raise the requirements in our college courses and require home economics for every girl? The automobile drivers have to get a license, and we have to get a license for a whole lot of things, and in order to get this license we have to meet certain requirements. Why can't we say that in order to get a marriage

license a girl has to have a diploma in home economics? It would not take long to raise the standard of our schools if we did that. I know some of you don't want to wait that long, but the time soon passes and you will be so much a better mother when you are trained for it.

Men train for everything they do. Why shouldn't the mother. It is not impossible. America thrives on doing what seems to be the impossible. It can very well be done if the women make up their minds to do it—or better if the men make up their minds not to marry a girl without this training.

Every girl can't go to college, because of lack of money, you hear said so often; but I say that every girl can go to college if she has the determination and health; that is all she needs. The United States Assistant Commissioner of Education, Dr. Zook, from Washington, recently visited our college. He was making a survey of educational institutions in Tennessee. When he came to our rooms he said, "I will have to just walk rapidly through your department because I want to catch a train in half an hour." He started through but he didn't catch his train. He said, "Let the train go." He stayed there over two hours talking and before he left he said, "Mrs. McMurray, one of the biggest educational problems in the country today is to finance education, higher education for the poor girl," and he says, "I believe Maryville has the solution."

THE "COLLEGE MAID PLAN."

Now, it is that plan that I am bringing to you. With your co-operation every girl in the country can have a college education if she wants it. Our plan is simple. Girls come into what we call the "College-Maid" Shop any time they want to, and they are paid for the things they make by the piece. If a girl wants to work one, two or three hours, that is all right, so long as she keeps up her studies. The girl is learning to sew all the time she is there and she is getting paid for her work. These garments that the girls make are sold wholesale to the big stores and retail to individuals. Here is how you can help under this plan: When you buy a ready-made garment try to get a "College-Maid" garment, then the money that you pay for it, or the money that would go into profits and labor actually goes toward paying some girl's college expenses. Isn't that a simple thing. Last year 229 girls made over $15,000 worth of garments and this year it will run over $20,000. The shop is self supporting. What we want to do is to create the demand for College-Maid garments and for this demand we are depending upon you. If you will make the demand so big that our college can't fill it, then we will organize some kind of an organization and send work to other colleges wherever poor girls need to earn their way through school. The trade mark says: "When you buy College-Maid you are helping some girl work her way through college." And on another part of the garment you will find,"I, a college maid, earning part or all of my expenses by sewing in the College-Maid Shop have honestly tried to make this garment well." This she signs with her number. These girls learn as well as earn. As soon as they can make aprons they are given something harder to do, and so on up until they can make any garment that is made with needle and thread. They make my dresses and they make my hats. They made the one I have on. I was told it was not as becoming as the one I wore this morning, but the girl who made it wanted me to bring it. Well, I came up without it and when I got to the hotel last night the hat was there. It just shows what they can do. They are taught to do everything. They are getting their education not by having money given to them so that they are independent, but by earning every penny of it, and keeping their self respect.

Now, what I want you people to do is to help spread this plan everywhere. I want to make it possible for every girl to have a college education. If you will just create this demand for "College-Maid" things then we will send to girls all over the country, wherever they may be, to school, and you will be helping to train them in home economics and educating

them for the purpose for which they were made, and with all this training we will inspire them to go back to motherhood, so that the girl's own slogan will be "Back to motherhood."

I thank you. [Applause.]

PRESIDENT ALLEN: The State Farmers' Institute has always been intensely interested in the subject of education. Having grown up in Illinois I have a great deal of pride in our educational system and accomplishments, but last summer in my ramblings over some of these United States I stopped at Washington, D. C., and while there I visited the educational departments in Washington, and talked with some of the leaders in educational thought, and I was surprised to find the standing, the relative standing of education in Illinois as compared with some states. In some ways we were well ahead and in other ways it showed plainly that we were deficient; painfully so in some respects.

Now, we have with us this afternoon a gentleman who has made a survey of the educational system of Illinois, and I think that no one is better fitted than he to present these things to you, and I take great pleasure in introducing to you Professor George W. Willett:

OUR EDUCATIONAL SYSTEM.

PROF. GEORGE W. WILLETT, *LaGrange, Illinois.*

PROF. GEORGE W. WILLETT: LADIES AND GENTLEMEN, MEMBERS OF THE ILLINOIS FARMERS' INSTITUTE: After the splendid address you have just heard, what I have to say will be pretty dry and tame and perhaps uninteresting, but I want to say in the beginning that if you get tired, get up and go out. It will be absolutely no discourtesy to me, and will not bother me in the least.

I was very much interested in everything that was said by the preceding speaker. As a preface to what I have to say I want to declare publicly that I believe that Illinois schools, high schools in particular, are at the forefront in progress. Some educators in the state seem to have the feeling that some of us are, or have been, opposing the Illinois school system because we have published some facts about Illinois schools. Nothing is farther from the truth. My philosophy concerning educational institutions and all other public institutions is that they belong to the people and that their business is the people's business. That means that the people should be told about both their good qualities and their shortcomings. It appears that there are educators even in Illinois who feel that the inside matters of school finance should be a closed book. Enough of this. I simply want to go on record here and now as being convinced that Illinois has the foundation of its schools well laid. I believe in the Township and Community High School when wisely organized and administered. I believe that the youth in most parts of Illinois are enjoying real opportunities which would not be theirs under the systems of organization which exist in other states. Hence, if I point out some inequalities which arise in Illinois, I need not be considered as opposed to the existing system. I again repeat that I believe in the Illinois organization even though I do maintain that certain inequalities should be removed.

Perhaps it will be well at the outset to give some indication of the origin of my interest in the financial and other phases of rural education in the State of Illinois. Several years ago in an elementary course on school costs at the University of Chicago, I became much interested in the matter of school bonding for various purposes. The upshot of the whole matter was that I decided to write a dissertation on school bonding. I had collected considerable material on the subject and had done considerable work with the material prior to 1922. At that time there came an opportunity to take part in the financial survey of Illinois schools which was being made under a grant from the Commonwealth Fund. My particular study was an investigation of the indebtedness for schools in Illinois. In

order to secure the data for the study, I traveled over the greater part of Illinois, actually visiting some seventy counties and securing first hand data from the records in sixty-six counties. This traveling over the state occurred in the months of October, November and December of the year 1922.

Wherever I went, I made it a point to interview people in various walks of life and as a result secured much valuable information. One of the big issues wherever I went seemed to be that of taxation for school purposes, particularly in some communities for township or community high schools. All sorts and types of reports were current. Some persons were emphatically in favor of the local institution while others were radically opposed. On the one hand one was told that the Community High School Law of 1919 was resulting in greater benefit to the people of the state than any other law which had ever been put on the statute books. On the other hand, the same laws were repeatedly characterized as the most vicious piece of legislation ever foisted upon a civilized community. At this point it should be noted that in most township and community high school districts, the tax payers seemed satisfied and in many would have actually resisted an attempt to impair in any way the local school.

Personally, though never having taught in the State, I was and had been much impressed by the township high school idea. I had known of such institutions as the high schools of Joliet, Centralia, Ottawa, Savanna, and other places. That such schools gave their pupils greater opportunities for securing a good education than could possibly have been the case had their revenue been limited to the income from property immediately within the city limits, went without saying. Furthermore, it seemed fair that railroads, factories, and other types of capital should have their property taken into the extended high school district, in order that they should pay a share in the education of the sons and daughters of their employes and of those tradesmen who were attracted to the vicinity of the community in order to supply the needs of the employes. As a usual thing, the more nearly the cost for any public service can be distributed, or allocated, to the several parties who receive benefits in accordance with the amount of benefit received by each, the more just is such distribution. If the school taxes of the coal mining regions of Franklin and Williamson Counties could be distributed among the various mining companies and other enterprises in accordance with the number of pupils for the presence of whom each separate mine or enterprise is responsible, the matter of financing the schools of Benton, West Frankfort and other communities would be much simplified. However, let us hope that there will never arise in Illinois a situation similar to that which exists in Iowa, where state aid (money collected from all over the state, probable largely from farmers) is paid to so-called poor mining communities. I claim that such a situation is absolutely unjustifiable. The industry itself should be so evaluated that revenue for the schools would come directly from the industry. If the industry is overcapitalized, or is endeavoring to hold too many men in its employ, let it eliminate some of its costs and then if it cannot bear its load let it cease to pose as a productive organization. Too much has been said and planned in the past about equalizing the opportunity for education without endeavoring to discover the source of the funds from which aid is to come. I was reared on a farm in an Iowa coal mining county. I was a school administrator for six years in the county seat of an Iowa coal mining county. I have a brother who is a union coal miner today. I know a certain mining district in Iowa in which aid is given, where the community boasts of the enormous tonnage which is put out. Why should the farmer and small landowners in Iowa be taxed to furnish state aid to so called "struggling mining camps?" Again, we say the industry should contribute its just share. The contribution moreover should be to the district funds of the district to which the children go rather than to the district in which the plant of the industry chances to be centralized.

But, we digress. In the investigation of indebtedness, it was discovered that most of the thirty-five and one-half millions of bonded indebtedness for schools was not located in the large cities. Chicago had no bonded indebtedness. The debt was largely in rural and smaller urban communities. Over fourteen millions of it was in community and township high school districts and a very large share of this in the high schools with small enrollments. In delving into the matter of what property lay back of the bonds as a guarantee, we come upon the fact that in some if not most of the districts, property outside of the elementary district in which the high school building was located, far exceeded in assessed valuation the valuation of the property which was within the central elementary district. The question arose in my mind, "How does the enrolment of students from the rural portions of the high school district compare with the enrolment from the urban or town part of the district?"

This question arose in part as a result of the oft-repeated claim of proponents of the extended district that the country high school pupils were the ones who were most benefited by the extension of district boundaries to include rural territory. If the rural assessment is greater than the urban assessment, in order that the farmer claim should be true, it would be necessary that the enrolment from rural parts of the district should exceed the enrolment from the urban part of the district by even a greater margin than did the assessed valuation. I had suggested to a number of research students in education that there was a real field of investigation on this point, but no one had seen fit to take up such an investigation.

HOW THE INVESTIGATION STARTED.

In March, 1924, a committee from the Illinois Agricultural Association called me into conference with them and outlined a plan for an investigation into what was most desirable educationally for the rural people of the state. The outline submitted was well conceived although perhaps too extensive in some ways and lacking in intensiveness upon any one particular phase of the field to be investigated. I was asked if I could give my summer over to this work. I had to reply that I was already scheduled for eight weeks teaching in the University of Michigan. I was much interested in the proposition because there was no question in my mind that there was a field for actual service to rural people and to education in Illinois. There has been too much slap-dash legislation in the past, based on pure imagination backed by no facts. I was much impressed by the frankness of the committee. They were all very definite in their statements as to their being desirious of getting at facts whatever those facts might be and whatever might signify. I was also much impressed by their desire to co-operate with the Illinois Educational Commission. The upshot of the whole matter was that I agreed to take over the supervision of the investigation and was to secure a competent investigator to do field work during the summer.

Experience has taught educational investigators that it is useless to attempt to secure accurate extensive data or any data which are difficult to secure by the old method of sending out blanks to be filled out. Questionnaires do bring certain information which gives indications of trends, but never can one depend entirely up on the accuracy of such reports unless they are self-checking, or there is other information to check their approximate validity. Hence, it was decided to employ a field expert to go from county to county visiting the courthouses, there to secure data directly from the offices of the county clerk, the county superintendent of schools, and from other sources if necessary to verify the accuracy of the data secured. On my recommendation Mr. Carl B. Althaus of La Grange, was named field investigator. Mr. Althaus was eminently capable of doing the work, having made a somewhat similar investigation of school population in Du Page county. Then too, I knew that I would be in daily contact with him both preceding and following his field work. The results have justified the appointment of Mr. Althaus.

THE QUESTIONNAIRE.

As a preliminary to the field work planned, it was decided to secure definite information from those township and community high schools which were willing to co-operate. Accordingly a self-checking questionnaire was made up, in co-operation with the Illinois Educational Commission, and sent to four hundred principals of township and community high schools. Suburban high schools of Chicago were eliminated from the list.

The questionnaire read as follows:

"La Grange, Illinois, May 14, 1924.

"Dear Principal:

"The Illinois Agricultural Association in co-operation with the State Education Commission and certain other groups is entering upon a study of school problems in Illinois. It is the feeling of these groups that recommendations for further legislation should be based on facts. Your co-operation is sought in securing certain data for the studies. Will you please give the following information relative to your school.

1. Name of high school.....
2. The number of high school pupils enrolled in your high school during the year 1923-1924.....
3. The number of pupils enrolled in your high school who reside in the elementary school district in which the high school building is located..
4. The number of pupils in your high school who reside in other elementary districts which are within your high school district.....
5. The number of pupils in your high school who are non-residents in your high school district.....
5. The number of pupils in your high school wrho are non-residents in your high school district.....
6. When was your high school district established?.....
7. When was your high school building built?.....
8. Does your high school give a course in agriculture?.....

It may be noted that the sum of the answers to questions 3, 4 and 5 should always be equal to the answer to question 2. The other questions were only inserted for purposes of further investigations if needed and were really almost entirely neglected in the final interpretation with the data. The purpose of the questionnaire should be quite evident. We desired a statement of the distribution of the enrolment between rural and urban portions of the district. In every case if the data given failed to check as indicated above the school was either discarded, or was written again with explanations as to what was wanted. The results reported later are therefore those secured from the reports over the signature of the principals of the several schools. A further check was made in that the total enrolments were approximately checked against the enrolments reported in the State Educational Directory.

The questionnaires were originally sent out on May 14, 1924, in order to reach the principals before the summer vacation should begin. Most principals were undoubtedly very busy preparing for the closing of school at that time. However, the response from them was far beyond that which one would normally expect. The farmers of Illinois are to be congratulated on having men at the heads of their township and community high schools who were so ready to respond to our inquiries. Originally we had thought that we wished to receive useable data from thirty-five to forty high schools. We actually received answers from more than three hundred and after some additional writing from 222 schools which were in useable form. The information from those schools gave a working basis for Mr. Althaus' study. Incidentally it should be mentioned that more of the reports were in usable form but were not used because it was decided to investigate the records on other matters in only thirty-five counties. Reports from high schools in other counties were necessarily not included. A questionnaire of a different nature was sent to the several county superintendents. This material, however, was only used indirectly in connection with the investigation.

THE FIELD WORK.

It has been mentioned that Mr. Althaus visited thirty-five counties and gathered data. The following are the counties visited:

Bureau, Champaign, Christian, Crawford, DuPage, Edgar, Ford, Hancock, Henry, Iroquois, Jackson, Kane, Lake, La Salle, Livingston, McHenry, McLean, Macoupin, Marion, Mason, Ogle, Piatt, Pike, Pulaski, St. Clair, Saline, Stephenson, Tazewell, Union, Vermillion, White, Whiteside, Will, Winnebago and Woodford.

Upon visiting a county seat, Mr. Althaus proceeded to make a map of the county showing the various township and community high school districts. He then traced through the various township treasurers' reports in the county superintendent's office the following items for each high school district: enrolment in high school, enrolment in each of underlying elementary districts, census for each elementary district, tax levy for each elementary district and for the high school district, the tax rates for each, the current expenditures for each high school district and for each elementary district. In the county clerk's office he secured the assessed valuation of each high school district and of each elementary or part elementary district underlying the high school district. Some of these data were later used only in interpreting the meanings of the other more important items.

At this point I desire to pause to give credit to Secretary N. B. Henry of the Educational Legislative Commission for his suggestions as to the wishes of adding certain items to the list of facts which we had decided to secure from the county offices. The added items were invaluable for later interpretations of the more outstanding items considered at first. It is well also to call attention to the distribution of the counties which were visited. I believe you will all agree that they represent nearly all types of rural situation. In other words the data gathered should be quite representative. The counties were not chosen because of their peculiar conditions but rather because they actually represented the various parts of the state. Only a brief summary of Mr. Althaus' findings will be given at this time.

SCHOOL COSTS PER PUPIL.

To begin with, as many would suspect, he found that the high school of small enrolment is exceedingly expensive. The per pupil cost of many of those with enrolments of less than seventy-five was in excess of $175. In some it ran beyond the $350 mark. The large high schools tended to cost much less per pupil than did these small schools. But still more unfortunate does the situation appear when we learn that many of these small schools are giving work which is not accredited for entrance upon the University of Illinois. As Mr. Althaus puts it, those schools which are accredited by the North Central Association of Schools and Colleges and by the University of Illinois had a lower per pupil cost than did those which were accredited only by the University. Those schools which were recognized by the state but not accredited by the University had a still higher per pupil cost, while those schools which were not fully recognized by the state were the most costly of all.

What does this signify? Simply this, that children who live in districts which maintain an unaccredited high school must of a necessity attend the unaccredited high school and thus be excluded from direct continuation of their education unless thir parents are willing to pay tuition for their attendance elsewhere. In a scientific investigation carried on in the state of New York in 1922, it was found that seventy-five pupils constituted the minimum enrolment for maintaining a standard four year school. Many schools with smaller enrolments are accredited in Illinois but pupils in such schools are severely handicapped because of the limitations necessary in such schools. Little wonder that some farmers complained about paying heavy taxes to such institutions, especially when as some expressed it, the child had to go an extra year some place else or to take private tutoring before being permitted to enter a college, normal or

university. This is no argument for additional accrediting. It is rather a plea for protecting the youth against make-believe high school education. A statement which will bear consideration is the rather trite saying that a high school has no business to interfere with any child's securing an education. Pseudo-education is a hindrance rather than a help on any occasion. Would-be four year high schools without accreding privileges too often signify pseudo-education.

AREA OF SCHOOL DISTRICTS.

Mr. Althaus discovered that the 222 districts varied in area from 3 square miles to over 120 square miles. He also discovered that there seemed to be no relation between the tax burden distribution to farmers and the size of the district. He found high school districts containing only one elementary district and others as many as 26 whole or part elementary districts. In some districts the school building was centrally located while in others it was decidedly at one side and in some cases in one corner. In one district with less than 50 pupils enrolled, part of the district was fourteen miles from the school house by nearest road. Perhaps the situation in the extreme corner of the said district if actually figured out would be somewhat worse than was the situation in the Lyons Township High School District prior to the voluntary releasing of certain distant portions of the district. It was discovered on investigation that one district in the extreme corner about five and one-half miles from the building had actually paid $10,000 in taxes for each pupil from their district who had graduated from the high school. In this case the proper adjustment was made by releasing the territory which really should never have been included in the district. Most high school districts in which difficulties and objections have arisen could become happy communities were similar adjustments made in them. The independent high school district is a fine thing when it is justly organized and justly administered. The opposition which arises from malformed and maladjusted districts should not be permitted to work to the detriment of other satisfied and well-served districts.

ENROLLMENTS AND ASSESSMENTS.

The most important portion of Mr. Althaus' findings relate to the ratio of the portion of high school pupils furnished by rural regions to the portion of assessed valuation of the district which may be regarded as purely rural. In attempting to get at these ratios certain arbitrary limitations between rural and urban communities had to be determined. It was decided to call all property which was included into the central elementary district, the elementary district in which the high school building was located, urban territory. All which lay outside this central district but still remained within the high school territory was rated as rural. We believe this division is justified. First, because the territory which lies in the central elementary district would all be taxed for the local high school if the central district maintained its own high school, i. e., any property in the central elementary district would in reality be considered in the city or village school district irrespective as to whether it was farm lands or not. Second, any small urban group outside of the central elementary district naturally partake of the nature of rural property and perhaps exist purely because of local rural demands.

The 222 districts were considered on the two points as to relative enrollments from rural territory and as to relative assessments on rural property using the definition just explained as to the distinction between rural and urban. The results revealed that in the aggregate the rural assessment was 68 per cent of the total assessment in these districts. This is equivalent to saying that the rural territory of these 222 high school districts pay 68 per cent of all the taxes required to run the schools while the urban or town territory pays only 32 per cent. This has even greater significance however, because it means that the same ratio is true for all other taxes covering this territory because one assessment functions for all taxing agencies. But someone will say "Perhaps the pupils in these high schools come from rural regions." The investigation revealed that only

38 per cent of the pupils come from the rural regions which 62 per cent come from the urban or town territory. In other words the rural territory of these 222 high school districts furnish 68 per cent of the taxes for running the school while only 38 per cent of the pupils come from this territory. Verily, the rural people are bearing a disproportionate share of the burden.

In dealing with data in the aggregate, there is always an opportunity that the results may have been seriously influenced by a few extreme cases or by the fact that the data were really not comparable. To avoid such a possibility the data were analyzed as to the extent to which the general tendency reported above was true. Only nine of the 222 districts found the urban territory furnishing a larger percent of the assessment than of the enrollment. In at least one of these cases, the reason for such situation was that the high school building had been built across the road from the chief elementary district. A comment from the principal of the school indicated that had this not been true, his school would have undoubtedly followed the general rule for assessment and enrollment. This school was the only one in which there was any great variation in favor of the so-called urban territory. It is quite possible that other districts of the nine had the same apparent error as an explanation. Twelve districts showed an equal balance as to distribution of assessment and enrollment between urban and rural territory. One district could not be included on the point because of insufficient data. The remaining 198 districts all showed a disproportionate per cent of assessment, when compared with their per cent of enrollment. The most extreme case, showed approximately 88 per cent of the assessed valuation for a rural constituency which furnished between 10 and 20 per cent of the total high school enrollment.

What does this signify? In our estimation its most important deduction is that there should be a reorganization of our system of assessing property. If the above disproportionate assessment is true of the territory covered by these districts for high school purpose, it must also be true for other purpose, i. e., the assessment on any piece of property is common for all taxing units which cover it. Consequently the township, the county, etc., all get their share.

Let me just digress here for a moment to say that there has been much trouble in collecting and turning over the money collected as taxes to the various bodies, and here is a resolution which was passed by our Board not long ago which I would like to read:

"Whereas, It is provided by the Revenue Act of the State of Illinois that

"The respective County Clerks shall, on or before the 20th day after the first day of December, annually, or as soon thereafter as the collectors are duly qualified, deliver to them the books for the collection of taxes.

"And, hereas, It is also provided in said statutes that

"The town and district collectors shall return the tax books and make final settlement for the amount of taxes placed in their hands for collection on or before the 10th day of March next after receiving the tax books.

"And, Whereas, For divers reasons, the County Clerk of Cook County in the year 1924 did not have such tax books ready for delivery to said town collectors until approximately the first day of March, A. D. 1924, and said County Clerk has not yet prepared said books for delivery to said collectors, and in all probability will not be able to deliver same until after the first day of March, A. D. 1925, thereby leaving insufficient time for the town collectors to make the collection of taxes

"And, Whereas, It is highly important to the various municipalities lying within the county of Cook, that so far as possible the taxes be collected by the township collectors in order to expedite the collection and the payment of such taxes to the municipalities entitled to the same, and also for the convenience of the taxpayers in making payment to the local collected;

"And, Whereas, It will be impossible this year for the local township collectors to make any collection of taxes whatever because of the great delay in the delivery of the tax books to them unless appropriate legislation be enacted granting them an extension of time;

"Now, Therefore, Be It Resolved by the Board of Education, Lyons Township High School, District No. 204, T. 38 N., Range 12, a municipal corporation, lying within the County of Cook, and State of Illinois, that the General Assembly of the State of Illinois be, and they hereby are requested to enact appropriate legislation with an emergency clause annexed thereto, which shall grant the township collectors of the County of Cook and State of Illinois, an extension of time for the collection of taxes, of at least 30 days from the date of the delivery of them by the County Clerk of Cook County, of the tax books, and that extension be granted the taxpayers for the payment of taxes to 30 days after the delivery of such tax books to said township collectors before delinquent penalties shall accrue upon the taxes assessed against them or their property."

Of course, the degree of disproportionate burden may vary for the different taxing units because the figures quoted above are not on population but upon high school enrollment. It may be that the populations for rural and urban do not vary in the same ratio as do the high school enrollments. Such is actually the case.

OTHER FACTS FOUND.

It was impossible to get the population figures nor were we really interested in getting them because they would not have really meant anything for our study. However, Mr. Althaus did get certain other very significant figures, namely, the elementary enrollments for urban and for rural territory, and the school census for the two sections. He discovered that approximately 50 per cent of the elementary pupils lived in rural regions and a like per cent in urban territory. He also found that the per cents for the school census were approximately 50 per cent in each case. In other words the children of school age living in these high school districts were almost evenly divided between rural and urban. This indicates several things. First, a smaller per cent of the rural children than of the urban apparently were entering high schools. In other words, the high school was reaching fewer of its rural clientele than of its urban clientele. We shall not endeavor to offer any reasons for this situation. Second, any extension of the boundaries of urban elementary districts to include rural territory, would usually mean an increase of tax burden to rural people in that the rural property would of necessity contribute to the education of elementary urban pupils. This would result because as has been said the rural assessment was 68 per cent whereas the rural elementary enrollment and school census evidenced the fact that a scant 50 per cent of the pupils to be educated reside in rural territory. Or to look at it in another way, the urban territory would be furnishing 50 per cent of the pupils and 32 per cent of the taxes in any such extended elementary district while the rural regions would furnish a like 50 per cent of the pupils but would pay 68 per cent of the taxes. There is no denying that such extension of districts would increase the disproportionate burden on rural property.

In opposition to the application of the above findings some people have suggested that the theory of people contributing to education in accordance with the number of their children, has long since been exploded. We agree with the statement but deny that their contention applies to the existing situation. The theory which took the place of the old theory is that people should contribute to the general funds for public education in accordance with their individual abilities. Hence, before this theory can be considered as vitiating the apparent significance of our findings, it will be necessary for those proposing it to show conclusively that net returns from rural enterprise is greater than from urban to the extent which will offset the disproportionate assessment figures. Personally, I am quite confident that such a condition as to relative income does not exist. All data which have come to my notice tend to indicate that the opposite is true and that rural income is at a disadvantage. We are inclined to believe that the migration of people from farm to city is in a great measure due to the greater economic opportunities in the city. Then, too, when we consider that the average village or city in a rural county is supposed to

exist largely to minister to the economic needs of the rural region, an additional question arises as to its right to add through itself, any increased burden to the community which it is supposed to serve. I am not attempting to answer any of these questions but believe they are worthy of your earnest consideration. Personally, I am confident that any public institution which is not based on a truly economic foundation is bound to be a source of continual dissatisfaction until readjustments place it on such just economic basis. Bear this in mind, this is no brief against the township and community high school: I believe in the township high school and in the community high school and believe that any widespread attempt to discredit them will result in a serious social and economic loss to the people of the state and particularly so to farmers. What is needed is a readjustment of the whole taxing system of the state. Our taxing scheme was instituted to care for an earlier age with absolutely different conditions existing. Schools are only one phase of the situation. This is no new idea. It has been handed along for years. The definiteness of the investigation of Mr. Althaus gives concrete data to show the disproportionate portion of assessed valuation and consequently of taxes which has fallen to the farmers' lot. What the farmer shall do about the matter is not for us to say. In my estimation, Mr. Althaus' study is far the most significant of any study yet made on the matter of school finance in Illinois. We imagine that some people will strongly resent its being made public because it will be contrary in its implications, to some of their preconceived ideas of the millenium in education. We rejoice all the more that it is to be made public. Criticism is often to be desired. It makes people think. So much for Mr. Althaus' report. We commend it to you.

OPINIONS FROM FARMERS.

A questionnaire was sent out to the several Farm Bureaus to be distributed to representative farmers. About 920 replies were received for tabulation. They came from all parts of the state, from renters and farm owners, from owners of from 20 acres up to 1,800 acres. All types and sizes of farms were represented. As was stated earlier, the returns from a questionnaire at best is only an indication of trends. With so small a percentage of the farming population of the state represented by answers to the questionnaires, care must be exercised in drawing even tentative conclusions. However, certain things do seem to stand out. The Illinois farmer is interested in education and keenly so. Only a negligible number thought education at public expense should be limited to the elementary years. Ninety-five per cent of those answering who had younger children expect them to go to high school when they are old enough. Sixty per cent of those who lived in township or community high school districts were very favorably impressed by what such schools did. In particular, did nearly all appear well pleased with the work offered in their local high schools. A very considerable number did express themselves as favoring more attention to agriculture, manual training, domestic science and commercial subjects. But farmers from high schools which are not accredited were decidedly outspoken in demanding that subjects be offered which would enable their sons and laughters to go on to college without extra preparation. In several cases, the feeling that the Bible should be studied was expressed. Some favored greater attention to physical training and athletics while others insisted that such activities were wholly detrimental to high school work and to that of farm children in particular.

The one room school, in the opinion of those answering, is the most desirable type of rural elementary education for Illinois. Seventy-six per cent of those answering expressed their preference for this type of school while only a 24 per cent favored consolidation for their communities. Many real reasons for such preferences were offered. Such matters as transportation, long days for little folks, bad roads, and the undesirability of having the school for rural elementary pupils located in urban centers are worthy of earnest consideration on the part of those who are endeavoring to establish consolidated schools. It is no misnomer that some country boys and girls of tender years are led away by the glitter of urban life even in small

villages. Then too, those farmers who maintain that the work offered in the village or city is usually not given with the idea of the highest benefit to the farm boy, too often have just grounds for their complaints. "Busy work" so called, may have a place in some city schools, (we doubt it however), but it certainly is out of place for rural pupils. Chores, etc., furnish busy work for them and of the best type. We are inclined to think that there is something to the contention of some of those who declared that they would favor consolidation if the school buildings were lcated in rural surroundings rather than in some village or city.

Transportation is a big factor in any extended district. I was in school work for a number of years in Minnesota. In that state any child who lives more than a mile and a half from school must be transported at the expense of the district. Personally, I favor such legislation in Illinois. A good school building which is within a mile of a farm or other piece of property is an economic asset to such property. Such a school building becomes a liability when it is five or more miles distant. Hence children should be transported from the outlying portions of a district. If a zoning system of taxation should be established, the matter of transportation might be avoided. Zoning would furnish relief equally for those with and without children and would place the heavier burden on those whose property had appreciated in value because of the public improvement. Zoning, it seems to me, is worthy of investigation by farmers. They are the people who would most benefit by such a system of taxation.

It occurs to us that the rural junior high school to be located in small communities and to cover the work of the upper years of the elementary grades and the first or first and second years of the high school, may help to solve many rural problems. Small struggling four year high schools could give place to such institutions. Graduates from such junior schools could enter the upper years of the larger high schools and finish under conditions which would enable them to enter college, normal or university. Those who might not want to enter higher institutions could have the advantage of taking up types of work which the larger high schools offer. Many who drop out at the end of the eighth grade would probably get one or two years additional training if the junior high school were near their homes. The objection to consolidation which arises from the transportation of small children could be eliminated and as many persons answered they would be able to have the high school children home at night until they become more mature. The work in such schools could be departmentalized and thus enable pupils to have better instruction and at a lessened cost because of larger classes. In our estimation the rural junior high school would be a real step of progress in rural education.

OUTLOOK GOOD, RADICAL CHANGES UNNECESSARY.

The outlook for rural education in Illinois is good. Too much has been said in depreciation of the "little red school house." We have been told what wondrous deeds men have accomplished "in spite of it." Rather would I say that many such worthwhile deeds have resulted "because of the little red school house." What the rural school needs is a good, sympathetic teacher, one who believes in rural people and sees the possibilities ahead for rural pupils. Too often consolidation signifies the introduction of city education with its so-called "busy work." The rural boy and the rural girl receive training in real "busy work" outside the schoolroom. Why waste their time and energy on artificial make-shifts? When consolidation occurs, the rural regions should have much to say about what shall constitute the course of study, and so forth, i.e., the country districts should not constitute an appendage to the village school system but should have its share in the management and in the determination of policies.

In our estimation, the Illinois school system is near the lead in the march of progress. No radical changes are necessary to bring it to the stage of efficiency which we can normally expect to reach. Rural education has its own particular problems. Such problems must not be lost

sight of, in the maze of city problems, nor should their solution in any way impede the progress in city systems. We need co-operation, not domination or usurpation on the part of either country or city.

Recently we received a suggestion from Mr. John S. Collier of Kankakee which is worthy of consideration. The suggestion was that high schools, especially rural high schools should modify their courses, or rather should introduce a short course for the boys who have to work on the farms during the spring and fall. His suggestion has real value in that he maintains that such course should not be agriculture, but rather arithmetic, orthography, business law, bookkeeping, English, United States History, civics and similar studies. Whenever a sufficient group of pupils to form a separate class are ready to enter our high school, we will start a new class or new classes, irrespective of the time of the year. I believe that most other high schools stand ready to do likewise. What is needed is that someone act as an agent to get together those who are available for such work.

Personally, I would favor not limiting it to those under twenty-one years of age. I would favor accepting any who had been denied the opportunity of securing an education. Fathers as well as sons could often do work of this nature in the winter months, at least in part day sessions. Many of our communities have built buildings which are large enough to house all the inhabitants of the district. Why not use those buildings? I suggest the elimination of the age limit because by so doing you not only could accomodate the older persons but could actually justify running short courses in many communities. More and more we are becoming convinced of the fact that education continues for many years beyond our arbitrarily chosen 21 years. The first duty of a school is to serve its community. If it can best serve by breaking with established procedure, let it break. A word of caution is in place at this point. Reforms prove undesirable later because the reformers fail to see all the factors in the case. In arranging for such new groups as we have been discussing, the fact that many if not most of our pupils will need the usual type of education must not be overlooked. No one should attempt the short-cut who can travel the main road. Too often a bridge is out on the short-cut and the detour requires more time and gas than would have been the case had the main road been followed.

I thank you. [Applause.]

PRESIDENT ALLEN: The next number on the program will be a reading by Mrs. Harriet Morgan.

Reading.....Mrs. Harriet Morgan

PRESIDENT ALLEN. That completes the program for the Thirtieth Annual Session of the Illinois Farmers' Institute.

And now, in conclusion, let us all rise and sing "Illinois."

Song ..... Ensemble

PRESIDENT ALLEN: The convention will stand adjourned.

Whereupon the Thirtieth Annual Session of the Illinois Farmers' Institute adjourned.

MINUTES OF THE MEETINGS

of the

Board of Directors and Various Committees

of the

ILLINOIS FARMERS' INSTITUTE

For the Fiscal Year Ending June 30, 1924

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS HELD AT SPRINGFIELD, SEPTEMBER 16, 1924.

Pursuant to the call of the president, a meeting of the Board of Directors was held in the Institute Rooms, State House, Springfield, September 16, 1924, at 10:00 o'clock, President Allen presiding.

Present: Directors Allen, Barrett, Burroughs, E. W. Burrows, J. B. Calhoun, Goodwin, Gray, Gregory, Hopping, Hufford, Mann, Mason, Maxcy, Page, Pickett, Schilling, Switzer, Tullock, and Webb.

The minutes of the previous board meeting and executive committee meeting were read and approved.

The Secretary presented the following report:

To the Board of Directors:

The district conferences held in April were, from the standpoint of attendance and interest, exceptionally successful. Nearly every county was represented by a full delegation at their respective conferences, and many of the delegations numbered more than the officers officially notified of the meetings. Except in some few cases, the county officers had definitely considered plans for the new year's work and, as a rule, were pretty well decided on the kind of schedule desired. This applies to both county and local institutes, and as a result schedules and assignments of speakers have been prepared for ninety-seven out of the 102 counties in the State. Of the five counties for which final schedules are not yet arranged, three are being worked out and will be completed soon. The completed schedules have been published in Bulletin No. 31, copies of which have recently been mailed to board members, county officers, speakers, county advisers and County Superintendents of Schools.

Speakers' Bulletin No. 31, contains the completed schedules for 97 counties, and lists a total of 368 days of institutes, and 1042 separate institute sessions at some 224 points throughout the State. The total number of speakers assigned is 142, of which 108 are from the State Institute and 34 from the State University and State Departments.

The demand for institute speakers for the coming season exceeds that of last year, a number of counties having exceeded its regular quota in the requests made. The assignments which have already been made in the arrangement of the schedules as printed represent very nearly the full number possible under the present available funds for speakers' service. The completion of the three or four remaining schedules will take up practically all the possible assignments for State Speakers requiring a per diem fee, and as the schedules now stand there is no opportunity for assignments of additional speakers, except as such speakers may be secured from the University, State Departments, or other sources where a per diem fee for services is not required.

Since your last meeting, three special bulletins have been prepared and published, including, "Alfalfa Guide Posts in Prose and Pictures", "Picture Pointers on Pork Production" and "Some Economic Problems", Many requests are being received for additional copies of these bulletins. We anticipate some second editions will be required to meet the demand. Demands for copies of several publications issued last year continue to come in and several second editions have been issued in order to care for these recent requests.

The 1923 Annual Report is on the press, the printing being about half completed. Except for some unexpected delay, the edition should be ready for distribution in early fall.

The Household Science Department Year Book is also in the hands of the printer and work on same will be pushed as rapidly as possible.

Applications for scholarships in the University of Illinois, beginning with the present fall semester, have been received in about the same number as recorded last year. Nominations have already been filed with the Registrar at the University as follows. In the College of Agriculture, 59; and in the Department of Home Economics, 37. September 22 and 23 are the last registration days for this beginning semester, and as nominations may be made on or before the registration days of the semester with which the scholarships are to begin, there is sure to be a number of later applicants for which additional nominations will be made before it is too late for them to be accepted at the University in accordance with the rules of the Board of Trustees. Applications for scholarships beginning with the February semester can be made at any time and will be taken care of promptly on receipt, the nominations being made in due time for the awarding of the scholarships.

In connection with the plans for the State Meeting, your Secretary visited Paris Tuesday of last week, meeting with the local committee. The new hotel has been completed and opened to the public for about three months, and will provide excellent accommodations for our February meeting. The new hotel management assures us of at least sixty rooms, which is a larger number than it has been possible to secure in one house at any of the recent Annual Meetings. In addition, the dining room service the lobby facilities are equally advantageous and will add greatly to the accommodations for our meeting. Local conditions generally seem to be very satisfactory. Advertising Stickers have already been supplied for the use of the local organizations and business interests will cooperate in making the meeting a success. The ideas and suggestions of the local people regarding the make-up of the program were secured, preparatory to working up the tentative outline for presentation to the Board at its December meeting in Chicago. In the meantime, it is hoped that every director will present any thoughts and suggestions which he may have on the matter and we urge that this be done at this meeting, or at least that the Secretary be advised by the various members before they leave for home.

Respectfully submitted,

H. E. Young, *Secretary.*

On motion the report was accepted and placed on file.

The Secretary reported the following committee appointments by the president:

Executive: Ralph Allen, S. B. Mason, F. I. Mann, A. C. Page, Frank S. Haynes and E. W. Burroughs.

Auditing: Chas. Gray, August Geweke and G. G. Hopping.

Legislative: Frank S. Haynes, John E. Barrett, E. W. Burroughs, Clayton C. Pickett and Harry Wilson.

Household Science: S. B. Mason, W. G. Curtiss, Wm. Webb, C. V. Gregory and H. Clay Calhoun.

Secondary Education in Agricultural and Household Science: A. C. Page, L. F. Maxcy, F. G. Blair, H. W. Mumford and Adam Schilling.

Highways: E. W. Burroughs, N. F. Goodwin, Geo. A. Switzer, D. M. Marlin, and Ira B. Reed.

Agricultural Books: H. W. Mumford, A. C. Page, F. G. Blair, L. C. Brown and John L. Hufford.

Entomology: L. C. Brown, F. I. Mann, Geo. F. Tullock, Wm. Webb and G. W. Curtiss.

Soil Investigations and Experiments: Ralph Allen, Geo. F. Tullock, F. I. Mann, A. N. Abbott, and N. F. Goodwin.

The Auditor reported that the books of the Secretary checked with the auditor's records, and that the detail report for the fiscal year ending June 30, 1924, would appear in the Annual Report which was in the hands of the printer.

The Secretary of the Department of Household Science presented the following report:

To the Officers and Board of Directors:

I am glad to make a little report of the work of the household science department accomplished since the annual board meeting. The conferences were held and the secretary was present at each of the 25 to assist the household science officers make programs for the coming winters' schedule. The department officers from the counties were present in good number and made their part of the county schedules.

The 1923 Year Books have been sent to all the clubs and county officers, the state fair school report compiled and edited and 2,000 copies printed, the 1924 report of the Dixon meeting is on the press and proof ready for my attention. The correspondence for the state fair school and our department has been taken care of and also our part of the speakers' bulletin prepared.

We have two bulletins in the unfinished state—one a course of programs for clubs and the other a Department recipe book but I cannot say when they will be ready for the press. Correspondence has been unusually heavy this year and many demands made upon us for program help.

The state fair school is on and we are having a most successful session.

I have not been to Paris to meet the women who have the work of the 1925 state meeting but I hope to go as soon as Mrs. Mann and I can arrange the time. We have some idea of who is wanted for speakers and three names have been suggested to us by the Paris women: Mrs. Anna J. Peterson, Mrs. Fannie Spaits Merwin and Mrs. Carrier. Let me assure you that we will come along with our program and make it the best in our history. I am already corresponding with people I have heard about so we can have something to suggest at the next Board Meeting.

Respectfully submitted,

MRS. H. A. MCKEENE,

Secretary, Department of Household Science.

On motion the report was accepted and placed on file.

The President called the attention of the Board to the article by J the use of Rock Phosphate and questioning the efficacy of the Illinois Sys Sidney Cates, in the July 26th issue of the Country Gentleman, discrediting tem of Permanent Soil Fertility, as taught by the late Dr. Cyril G. Hopkins, and proposed that the Farmers' Institute conduct a "poll of the Jury", as composed of Illinois farmers who have been following this system with a view of not only maintaining soil fertility but actually increasing the fertility and the productivity of their farms. A general discussion of the subject followed, the consensus of opinion being that the Institute should do what it could in more firmly establishing the Illinois System with a view of not only maintaining soil fertility but actually increasing the fertility and the productivity of their farms. A general discussion of the subject followed, the consensus of opinion being that the Institute should do what it could in more firmly establishing the Illinois System by continuing to direct attention to the practical and profitable results of its application under Illinois' conditions. The board members expressed approval of the President's contention that there is need for more general consideration of the fundamentals in agricultural production and that as farmers more thought should be given to those things which make for soil building and agricultural permanency which after all is the foundation of all industry.

The Secretary announced the Farmers' Institute programs to be broadcasted from Radio Station W.L.S., second floor of the Sears-Roebuck building at the State Fair Grounds at 12 o'clock and at 7:30 o'clock, President Allen, Directors Mann, Webb, Tullock, Mason, and Mrs. McKeene appearing on same.

On motion the board adjourned.

Respectfully submitted,

H. E. YOUNG, *Secretary.*

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE HELD AT HOTEL SHERMAN, CHICAGO, DECEMBER 1, 1924.

A meeting of the Executive Committee of the Board of Directors was held at Hotel Sherman, Chicago, December 1st, at 5 o'clock P. M., Vice-President Mason presiding.

Present: Directors Haynes, Mann and Mason.

The President and Secretary of the Department of Household Science were also in attendance.

Tentative plans for the State Meeting program were presented and discussed in detail by the members present. It was the sense of the committee that the first day's sessions be devoted to soil improvement subjects, the forenoon session being confined to discussion of the Illinois System of Permanent Soil Fertility. The second day was to include the live stock subjects and those of a miscellaneous character. The evening sessions and that of the last afternoon were to be of a general nature, appealing to audiences of both men and women. Suggestions of both subjects and speakers were listed by the Secretary for presentation to the Board of Directors at its meeting called for the following morning.

The officers of the Department of Household Science reported the suggested outline of the Department program and same was discussed by members of the committee.

On motion the committee adjourned.

Respectfully submitted,

H. E. Young, *Secretary.*

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS HELD AT THE INN, UNION STOCK YARDS, CHICAGO, DECEMBER 2, 1924.

Pursuant to the call of the President, a meeting of the Board of Directors was held at The Inn, Union Stock Yards, Chicago, December 2, 1924, at 10 o'clock A. M., President Allen presiding.

Present: Directors Allen, Barrett, Blair, Brown, Curtiss, Goodwin, Haynes, Hopping, Hufford, Mann, Mason, S. B., Mumford, O'Hair, Pickett, Reed, Schilling, Switzer, Tullock and Webb.

The President, Vice-President and Secretary of the Department of Household Science were in attendance.

The minutes of the previous board meeting and also those of the executive committee meeting were read and approved.

The Secretary presented an informal report, directing the attention of the members to the excellent reports of the county institues held during the fall season, and pointing out the fact that in practically every county the meetings had been attended with unusual interest by a goodly number of people. The activities of the office, including the supervision of the county institutes, the printing and distribution of bulletins and reports since the September meeting of the Board was also briefly touched upon.

The tentative program plans for the Paris Meeting, as outlined by the executive committee and the officers of the Department of Household Science were presented and were fully discussed, a number of additional suggestions being made by the various members.

Dean Mumford and Prof Blair spoke particularly of the great educational value of the work of the State Institute, emphasizing its importance and bearing testimony of the constructive results being accomplished by same. Dean Mumford complimented the State Institute on its consistent stand on the Illinois Soil Improvement program and suggested that same be given its usual consideration at the State Meeting. Prof. Blair gave a brief review of the programs in the introduction of Smith-Hughes work in the High Schools of the State, and predicted a still greater showing during the coming year. He also called attention to the opportunities offered Illinois in this important work if the maximum of Federal Funds were made available by State appropriations for matching the amounts obtainable from Washington.

Director Mason suggested that new roster cards be printed giving the personnel of the various committees.

President Allen reported a visit with Mr. Cates, the author of the Country Gentleman article criticising the Illinois Soil System, and also an interview with one of the editors of that publication in which the matter was discussed, stating that he was preparing an article, in defense of the System, which he hoped would also be published in the Country Gentleman.

Director O'Hair spoke of the plans being developed by the Paris people for the entertainment of delegates and visitors at the Annual Meeting and assured the Board that every effort would be made to assure the success of the meeting. He referred to the active co-operation being extended the local institute officers by other organizations and stated that nothing would be left undone which would contribute toward making the sessions the best ever held by the State Institute.

On motion duly made and carried the services of the following out of state speakers were authorized, providing they were available for the Paris dates: Dr. Lloyd S. Tenny, of the U. S. Department of Agriculture, Washington, D. C.; Prof. John Evvard, of the Iowa State College; Dr. W. C. Coffey, Dean of Agriculture, University of Minnesota; Dr. H. O. Pritchard, Indianapolis, Ind.; Prof. Mary L. Matthew, Head of the Household Science Department, Purdue University, Indiana; Miss Mary I. Barber, Battle Creek, Michigan; Miss Mabel L. Evans, St. Louis, Missouri; Mrs. Lawrence T. Foster, Crawfordsville, Ind., or other available speakers needed to complete the State Meeting program in accordance with the plans approved by the Board and its executive committee.

On motion the board adjourned.

Respectfully submitted,

H. E. Young, *Secretary.*

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS HELD IN THE INSTITUTE ROOMS, SPRINGFIELD, MARCH 3, 1925.

The Annual Meeting of the Board of Directors, was held in the Institute Rooms, Springfield, March 3, 1925. President Allen presiding.

Present: Directors, Allen, Barrett, Blair, Brown, Burroughs, E. W., Calhoun, Curtiss, Davison, Geweke, Goodwin, Gray, Gregory, Haynes, Hopping, Hufford, Mann, Mason, Maxcy, Mumford, O'Hair, Pickett, Reed, Schilling, Switzer, Tullock, Webb and Wilson.

The President and Secretary of the Household Science Department were also present.

The minutes of the previous board meeting and executive committee meetings were read and approved.

The Secretary presented the following report:

To the Board of Directors:

The Institute season of 1924-25, which is just closing, is a banner one in many respects. The general interest and activity in county and local institutes throughout the State have never been more pronounced than during the past year and the splendid success of the recent annual meeting at Paris is a note-worthy climax to one of the most successful years ever recorded by the Illinois Farmers' Institute. It has been a year of live, enthusiastic interest in most counties, exceptionally good co-operation from other organizations, comparatively few disappointments from the standpoint of program schedules, and in general a very satisfactory and highly creditable season with regard to local management, program features, community interest and actual attendance. In fact, mostly all of the contributing factors which go to make up a successful and note-worthy institute year have seemingly worked in our favor, even the weather-man, except in a few instances, having been unusually kind, with the result that the work has been attended with splendid records of accomplishment.

In our report a year ago, attention was called to the fact that there never was a year in Farmers' Institute history which did not record some poor institutes. This is not only true of each of the thirty years of Farmers' Institute work, to date, in Illinois, but will, of course, continue to apply in future years as well as in the past. Perfection is impossible, in institute work, as in all lines of educational endeavor. This is proper, for

were it not so there would not be the incentive to make each season a little better than the preceding one. Last year, we stated that no institute year ever recorded more good institutes, or a greater predominence of highly successful institutes than were held during that season, and while that statement was fully substantiated at that time, we are now justified in saying that that very successful season has been surpassed by the one just closing. There has been an increased interest and attendance in the majority of counties, and in many counties the showing from every standpoint has been better this year than last. In the number of counties doing creditable and successful work, both in county and local institutes, the records for the last two years are about the same with, perhaps, only a slightly gain in favor of the present season, but as a whole and, when reviewed from all standpoints, this season will be found considerably ahead of last. In almost every section of the State, a decidedly better interest prevails in all phases of farmers' institute work, and the understanding and appreciation of its real phase and function, along with other organizations and community activities, is more generally and widely manifest than ever before. That the Farmers' Institute in Illinois is not only meeting present day conditions and needs but in keeping abreast with the times in assisting and promoting the right kind of progress on the farm and in the farm home must be recognized by all informed, fair minded and unprejudiced people.

In order that board members may more fully appreciate the detail statistics covering the county and local institute work for the year, and even at the risk of excessively prolonging this annual report, we desire to direct attention to a few of the many reports which have been received during the season bearing on the success of the work in some of the various counties of the State. These are brief extracts from the reports from state speakers, county institute officers, county advisers, newspaper clippings and other sources from which we endeavor to keep in touch with the work as it is progressing during the institute season. Please bear in mind these are just a few excerpts from the many encouraging reports which have come to hand during the season and which have been selected at random. In other words, they are simply some of the high spots:

One of the state speaker's, who has addressed institutes in over fifty counties the last two years says, "My institutes have been exceptionally good this season. Interest and attendance better than last. At many sessions a case of "Standing Room Only." Another speaker, who has been in many counties for several years says, "This has been a banner year, only one poor institute out of twenty-two attended." "Never had such good audiences as this year," says another, and every one reports that the season has been an outstanding institute year. A number of county advisers have stated that their county institutes this year have been the most satisfactory in the history of the institute work in their respective counies. One reports an attendance of 2,776 during six days of institutes. Another that the meetings were the best ever held with a combination of speakers and subjects that could not be beaten. One county held five days of institutes during the severe ice storm in December and reports between 500 and 600 people at every session despite the fact that the storm made roads almost impassable with ice, broken telephone poles and wires which all but prevented the speakers making the daily assignments. An average daily attendance of over 1,000 attended the institute in a general Illinois county and one of the southern counties recorded an attendance of over 6,500 during a three-day meeting. Superintendent Blair addressed one county institute audience of over 2,000 and refers to the meeting as a splendid demonstration of the importance and value of the farmers' institute work. Clippings from more than thirty different newspapers in as many different counties report the various institutes as "the most successful meeting of its kind ever held in the county;" The courthouse not big enough to hold the institute people;" "Close to 500 turned out for every session;' "The institute was handicapped for lack of room;" "The meeting was the best in the history of the institute, the large auditorium being filled to capacity at

every session;" "Good crowds and fine interest;" "The lectures were largely attended and the exhibits better than in former years;" "One of the most profitable as well as the most interesting and best attended institutes ever held;" "Fine attendance and a big success;" "Large and enthusiastic audiences and the programs universally profitable;" "Greater interest than usual and a splendid meeting;" "The hall was not large enough to accommodate all who sought to attend;" "A wonderful success and a fine demonstration of community co-operation."

Among the counties holding outstanding institutes during the year may be listed Carroll, Whiteside, DuPage, Will, DeKalb, LaSalle, Bureau, Henry, Knox, Warren, Peoria, Iroquois, Edgar, Logan, Scott, Cass, Brown, Adams, Mason, Sangamon, Montgomery, Christian, DeWitt, Douglas, Crawford, Madison, Washington, Monroe, St. Clair, Effingham, Clay, Wayne, White and Hamilton. In Boone, Winnebago and McHenry, the institutes were not as successful as should be expected, either from faulty local management, insufficient advertising, lack of co-operation, or a combination of various causes all of which should and can be remedied by the right kind of institute leadership. In Lawrence, Rock Island, Mercer, Bond and Clark, no institutes were held, although two of these counties have already indicated that they will be in line with some good meetings next year.

At the district conferences held last spring, all but six counties were represented, and schedules were arranged for 96 counties. These schedules were announced in Bulletin No. 31, and with but one exception have been carried out practically as planned. Of the six counties which did not schedule institutes at conference time, two completed schedules later, leaving only four out of the 102 counties in the State in which no institute work has been conducted. In these counties as has already been mentioned, lack of co-operation from local organizations being the primary reason for no institute work.

In addition to the printed schedules, more than seven especially arranged institutes have been held during the year, all of which have proved successful. These later schedules have added something like 25 or 30 days to the list given in the bulletin.

A general summary for the year shows approximately 372 days of institutes at 241 points in 98 counties, which represents a total of 1,071 sessions and 1,170 days of institute service rendered by the State Institute during the season. Three counties have held ten or more days of institutes, eleven counties six or more days, and 47 counties three or more days is the record.

To date detail reports of the year's work have been received from 74 counties. While a summary of these reports is necessarily incomplete so far as the entire season's work is concerned, it is of interest to note that in these 74 counties whose reports have been received, 233½ days of institutes and 784 sessions, with a total attendance of 112,282 persons have been held. With a similar average for the remaining 24 counties not yet officially reported, the estimated days of institutes and attendance for all of the 98 counties in which institute work has been conducted will read, 378 days of institutes with an attendance of upwards of 182,139.

The number of speakers assigned to institute work during the season is 196, of which 143 are from the State Institute speaking staff and 53 from the State University and State Departments.

THE STATE MEETING.

The recent Annual Meeting at Paris was attended by delegates from over seventy counties, and the total attendance was probably the largest ever recorded at a State Institute. The audiences at the day sessions numbered from eight to fourteen hundred people and each of the two evenings over two thousand. The entire program was well received and considered by many one of the strongest ever presented at a State Meeting.

A wide amount of publicity was secured for the Paris Meeting. This was largely accomplished through the co-operation of the newspapers, which

were very generous in contributing of both news and editorial space, and the large amount of advertising distributed from this office. As usual, good use was made of posters, stickers, calendars, blotters, preliminary programs and news letters, some of which went to all newspapers, banks, farm advisers, county institute officers, household science department and club officers, institute speakers and workers throughout the State. The press associations made use of considerable copy both before and during the meeting. The railroads aided materially by the granting of open excursion rates and the posting of the colored posters in their local stations.

Splendid co-operation was extended by the various organizations of Paris and Edgar County, including the county farmers' institute, the farm bureau, and the Paris Chamber of Commerce. The local committees were well organized and functioned in excellent manner throughout the preliminary campaign and during the meeting. Nothing was left undone which would in any way contribute to the comfort and entertainment of the delegates and visitors during their stay in Paris. Few, if any, State Institute Meetings have been awarded a better welcome, or have received greater courtesy from the local people than at Paris.

PUBLICATIONS.

The 1924 Institute Report and the Report of the Department of Household Science, containing the complete proceedings of the Dixon Meeting, have been published. Distribution of both these volumes will be effected as rapidly as possible.

In addition to these Annual Reports, several special bulletins have been printed and distributed during the year, including the 1924 Speakers' Bulletin, "Alfalfa Guide Posts, in Prose and Pictures," "Picture Pointers on Pork Production," "Program Suggestions for Household Science Clubs." Many requests have been received for these bulletins, and second editions of some of them may be needed.

The distribution of all publications is governed by requests received for same. General distribution is confined to those who are interested enough to request copies of both the reports and bulletins. The number of the requests indicated an increasing demand for Institute publications.

Transcripts of the Paris Meeting are promised by the reporters at an earlier date than usual, and if these transcripts can be had as expected, it will help to facilitate the early printing of the reports. After the transcripts are received the addresses of all speakers are sent to them for correction and revision, and all must be carefully edited on their return here before submitting to the printer. Photographs must be secured and halftones made, and all copy read in proof and reread in revise proof, prior to the making up in pages. The page proof must then be read, the illustrations properly placed, the proof of cut captions read and corrected, and the indexes made and read in proof before the printing can be started. The composition, printing and binding necessarily takes considerable time, in addition to the immense amount of work required in editing and preparing the reports prior to going to the printer.

UNIVERSITY SCHOLARSHIPS.

During the year, applications for scholarships in Agriculture and Household Science at the University of Illinois have been received from 67 young men from 43 counties and 37 young women from 29 counties, all of whom were nominated in accordance with the rules of the University Board of Trustees. The authority for making these nominations is granted to the State Farmers' Institute by the University Trustees, the rule of the Board authorizing one scholarship each in Agriculture and Home Economics per county and one for each of the ten Congressional Districts in Cook and Lake Counties, with the provision that additional nominations from any one county, or district, may be made and accepted up to the number of five which may be assigned to other counties from which there are no applications. The first nominee from any one county or district, is awarded the

scholarship immediately on registration at the University, while additional nominees are required to pay the regular matriculation fees, which are later refunded after assignments to other counties, or districts. During the year all of the additional nominees have been awarded scholarships, the assignments being made by the Registrar of the University. All applicants of scholarships are advised, on receipt of applications, as to whether or not they are first from any one county, or district, those after the first being advised that they will be nominated as additional candidates, subject to the usual procedure of the University in granting scholarships by assignments to counties from which there are no applicants.

Of the scholarship nominations during the past year, additional nominations were made from 22 counties, 16 of which had two applicants for Agriculture or two for Home Economics and six having from three to five applicants for either one or the other of the two courses. No County presented more than five additional applications, the number designated by the rule of the Board as the maximum from any one county, or district and all the additional nominations were accepted by the University and the scholarships awarded. It is interesting to note that the personal investigations of the University, in every case, show all our nominees highly deserving young men and women whose use of a scholarship will undoubtedly reflect real credit to both the recipient, to the University, and to the Farmers' Institute. In approving of these additional nominees, President Kinley, under date of October 31, 1924, writes:

"I have been interested to observe the character of these appointments and I am sure you will be glad to know that all the evidence about the young people concerned indicates that the nominations which you have made have been excellent and evidently very carefully considered. The earnestness of these people is shown by their reports of what they have done to help themselves. On the whole this is a fine prospect and I am delighted with it."

These favorable comments were made by President Kinley concerning the additional applicants, both young men and young women for the Agricultural and Home Economics scholarships, as recommended in our nominations, and are facts which should be highly pleasing from the standpoint of the Institute.

FINANCIAL STATEMENT, MARCH 1, 1925.

The following is an itemized statement of funds appropriated, for the current year, and the balance on hand March 1, 1925, as classified by the office of the State Auditor:

Name of account	Appropriation	Bills paid	Balance
Salaries	$8,720.00	$5,813.28	$2,906.72
Office Expense	2,100.00	1,503.60	596.40
Reporting	700.00	.....	700.00
Per Diem	7,000.00	5,105.00	1,895.00
Directors' Expense	6,000.00	1,311.19	4,688.81
County Institutes	7,650.00	4,843.43	2,806.57
Contingent	200.00	.....	200.00
Equipment	200.00	.....	200.00

Since the last meeting of the Board, a former member and at one time its honored president, Prof. Chas. W. Farr, of Cook County has passed to his reward. Mr. Farr's death occurred January 8, last, from complications after a severe attack of pneumonia from which he was seemingly recovering. In his passing, the Farmers' Institute, and agricultural and educational interests throughout the State have lost a most sincere and loyal friend and one whose entire life and work was unselfishly devoted to public spirited service.

Consideration of the dates and locations of the District Conferences in the several districts is requested at this meeting. It is necessary that the entire schedule of these conferences be definitely arranged within the next

few days in order that sufficient time be provided for printing and advising the officers of the counties in the district holding their conferences in March. Any suggestions regarding dates or locations, should be made before adjournment, or at least before members leave the city. The plans as tentatively planned provide for a schedule similar to that of last year.

Revision of the list of state speakers should be made either by the board or a committee designated for the purpose. Several new speakers have been added to the list during the year and it is hoped that others may be suggested. Reports of the work of state speakers are always welcome and members are urged to offer any suggestions they may have regarding the personnel of the list.

Several of the addresses at the Paris Meeting should be published in bulletin form, and this is a matter which should be taken up at this meeting.

From the general reception awarded the Institute work during the last season, the hearty co-operation which has prevailed in practically every community and the increasing interest manifest, there is every reason to consistently expect a more successful Institute the coming year.

Respectfully submitted,

H. E. Young, *Secretary.*

On motion the report was accepted and placed on file.

Moved by Director Burroughs that the recommendations of the Secretary be referred to the new board upon its organization. Seconded and carried.

Moved by Director Haynes that the various delegations interested in the location of the next Annual State Institute Meeting be received at 1:15 P. M., and that each be given ten minutes to present its invitation to the Board. Seconded and carried.

Director Pickett, as Auditor-Treasurer, reported that the financial statement as presented by the Secretary agreed with the books of the State Auditor, and that the Auditor's report, covering the last fiscal year was published in detail in the last annual report of the Institute. As no funds are handled by the Institute Board, there was no Treasurer's report to present.

The Secretary of the Department of Household Science presented the following report:

To the President, Officers and Board of Directors of the Institute:

Gentlemen: Your secretary brings you a brief summary of the 1924 activities of the Department, to give only an idea of the scope of the work, and to mention results for good we have made together with any failures.

Soon after the Dixon meeting the District Conferences were held to make the county institute schedules and assign the speakers asked for by the representatives at the conferences. Your secretary was present at all of the twenty-five district meetings. Better methods for conducting county institutes were discussed and we have noted good and marked results in many counties, especially in the type of exhibits. May I say in passing that an exhibit just for show and premium means little. Exhibits which are educational should be the one thought and should be planned with great care. Premium money and rivalry as the main thought should be discouraged. The prize article as an education for others to copy should be encouraged.

The county household science presidents attended the conferences in most of the Districts and it is of the greatest importance that they be present or send representatives. It is there they have a voice in making their county institute plans, they meet the officers from other counties and exchange helpful ideas to carry on a more successful institute program. Every officer must be interested in the county institute and do her part in planning the work if progress is made. I wish we might have 100 per cent representation this Spring.

At the conferences 36 household science speakers were assigned for 395 days of institute work to appear before 672 sessions. Two speakers were listed from the State Department of Health for 15 days and 21 sessions, one

from the University of Illinois for two days and 21 sessions, one from the University of Illinois for two days and four sessions and 33 from our own Department list served 378 days before 647 sessions.

The co-operation of county officers and speakers the past year is noted and appreciated.

THE STATE FAIR SCHOOL.

The 1924 State Fair School was one of the best in the 26 years' history of the School not withstanding there were only 74 pupils enrolled. However, we had 105 applications. The late date of the fair and the changed minds of some of the applicants were the contributing causes to the smaller attendance. Again loyalty to this work is asked of applicants who are the means of keeping away others anxious to attend just by failure to stand by the rules of the Board. Accepting a scholarship is a pledge made to assume responsibility to take care of the running expenses of the school. At the 1924 session, 51 pupils were from rural and 23 from town homes; 14 were married and 60 single. All were deeply interested in the work and the personnel was of high standard. Not only cooking, baking, table service, home nursing and dormitory work were the subjects studied but a very fine special course in sewing, also millinery, music, interior decoration, dentistry, an afternoon tea with detail appointments and a buffet supper were a few of the added features offered during the two weeks.

Four new instructors were secured and with all of the extra necessary organization the school moved along in a most satisfactory manner. Every county and household science club officer should be interested in securing pupils for the State Fair School for that is one factor in making progress in the county work. September 11 to 25 are the dates for the 1925 session. There are no State funds for taking care of pupils' expenses but any one paying $12.00 tuition to cover board and meeting traveling expenses will receive great benefit by taking this short course under five competent instructors. (Age limit 18 to 40.)

UNIVERSITY OF ILLINOIS SCHOLARSHIPS.

The free scholarships given to the University of Illinois, Department of Home Economics, last year number 37. For more than twenty years through the courtesy of the University of Illinois these scholarships have been given by the Illinois Farmers' Institute to young women and men for the course in home economics and agriculture. The applicant must be a high school graduate, or its equivalent, and who has not been a pupil at the University. The scholarship is good for two years and, if the pupil matriculates, for two years more. Each county in the State is entitled to one scholarship except Cook and Lake which each have ten.

REFERENCE LIBRARY BOOKS.

The past year has broken all previous records in the club requests for books and material of every kind. Assistance rendered by the State Library and Department of Health was most valuable. These requests are not even listed except for the library books and special bulletins for club helps. Four hundred books have been in the field and 700 bulletins on the many subjects—when I say many I mean those which are not within the scope of our work and which are sometimes entirely foreign to it.

CLUB AND QUESTIONNAIRE FIGURES.

The total number of county organizations, or household science departments of county institutes, is 98. Lawrence has no county department and Rock Island, Stephenson and Vermilion do not affiliate but have only Home Bureau work.

Number of affiliated clubs today 325 making a total of county and local clubs 422 (two clubs reported just last week).

We list 40 which did not appear in the 1923 Year Book and that is most gratifying.

The annual questionnaire was sent out as late as possible to give all clubs an opportunity to make a summary of activities for the year. All secretaries do not respond with reports but with the elections held each month in the year it is impossible to have complete and accurate statistics and the following are given as incomplete figures.

The club directory of affiliated clubs is made from return cards giving officers and it is up to date, we hope. Returns were received from 200 clubs. Questions were not answered in full by many and we give you the most interesting, in the following: From 1898 to 1925 our local clubs have been following the work and we have some listed for 1896, the year the institute was organized. From 1910 to 1925 the largest number reported date of organization and these numbers range from two to eighteen. The years 1902, 1903, 1910 and each following year made the best reports.

The total membership in clubs reporting is 6,693 with 3,170 town and 3,523 rural members. Total average for the year's attendance 4,021. One hundred and twenty-five report meetings held monthly, thirty-seven semi-monthly and one weekly. Club membership ranges from six to 260. One reports 165 members with 85 to 100 per cent attendance. (All praise to this club.)

The 1923 Year Book of the Department was distributed at the Dixon Meeting and through the clubs, 20,000 copies being the number printed. The supply is exhausted yet we are having requests for the book from many of the different State Libraries and also foreign countries.

The State Fair School report was compiled and edited by the Secretary and 2,000 copies printed by the State Department of Agriculture, so not all of these booklets are available from our office.

The 1924 Year Book, or Dixon report, is here for individual distribution and the club requests will be looked after just as soon as the letters and return cards can be sent out. Twenty thousand copies of this volume were printed. The speakers' bulletin (and county institute schedules) No. 31 was prepared and we had our part in putting it together.

The new Program Suggestions Bulletin, just off the press, was compiled by the Secretary and 8,000 copies printed. Each contributor to the programs is recognized and we are sure the clubs will find valuable assistance from the pages of the suggestions. We hope to get this bulletin in the hands of every club officer at the earliest moment. Rush of work for this meeting prevented mailing it before.

CORRESPONDENCE.

It would be almost impossible and an unnecessary task for us to keep record of correspondence for the year for it includes club work, institutes, speakers, county officers, State Fair School, the State Meeting and much general correspondence with other organizations. An unusual amount of letter writing was required for the 1924 State Fair School and also for securing the club officers for the directory in the 1924 Year Book.

THE PARIS MEETING.

Just a few figures in the publicity for this meeting, which includes 4,000 large posters, 1,000 return reservation cards, 2,000 delegate credential blanks and 1,000 duplicates, 6,000 Paris hangers, 8,000 preliminary programs, 1,000 news notes, 10,000 blotters, 5,000 calendars, 7,000 formal programs, 10,000 Illinois stickers.

Last year for the Dixon Meeting 40 counties returned 205 delegate credentials. Every county and club organization should make the greatest effort to send credentials, even for the State office to have the latest officers, and plans should be made early in the year to provide means for sending delegates to the State Institute.

As you know, we had our part in the Paris Meeting and the program went through as planned with the exception of one speaker who did not appear, owing to illness.

The credential blanks showed a list of fifty counties with 207 delegates and alternates named from the various counties and clubs affiliated with the department.

The election of officers resulted as follows:
President, Mrs. E. W. Burroughs, Edwardsville.
First Vice-President, Mrs. H. M. Dunlap, Savoy.
Second Vice-President, Mrs. Elizabeth Gumm, Paris.
Also unanimous recommendation of the Secretary.

Respectfully submitted,

MRS. H. A. MCKEENE, *Secretary.*

On motion the report was accepted and placed on file.

The newly elected President of the Household Science Department, Mrs. E. W. Burroughs, spoke of the work of the Department, its aims and plans for the coming year.

Director Haynes, Chairman of the Legislative Committee, reported that the Institute budget had been approved by the Governor and was included in the regular Biennial Budget as presented to the General Assembly, and that the committee were prepared to look after Institute interests during the present legislative session.

Director Burroughs, as Chairman of the Committee on Highways, spoke of the proposed legislative program and recommended that the Institute support same.

Director Allen, as Chairman of the Committee on Soil Investigations and Experiments, reported that the Soil Survey work was nearing completion and would probably be finished within the next two years. He also spoke of the plans of the Hopkins Memorial Association and urged more active work in behalf of its project to have Poorland Farm as a permanent memorial to the memory of Dr. Hopkins.

Director Mumford, as Chairman of the Committee on Agricultural Books, reported that the University had published a list of Agricultural books and that this list merited the approval of the Institute.

Director Mann moved that the Institute Board approve the list of Agricultural Books as recommended by the University and aid in its general distribution.

Director Gregory moved to amend the motion deferring action until each Member of the Board was supplied with a copy of the list.

This amendment was accepted by Director Mann, and the motion seconded and carried.

Director O'Hair thanked the Members of the Board for the excellent support and co-operation extended by all in the successful conduct of the Paris Meeting.

Director Blair spoke of the Smith-Hughes Vocational Work in the High Schools and stated that the continuation of this work depended upon the State aid appropriation, referring to the fact that such appropriations were not included in the Legislative Budget as recommended by the Governor. Interest of the Institute in behalf of this important work was urged and Board Members asked to aid in securing the necessary state funds to continue and further develop the work.

On motion reports of all committees were accepted and approved.

The Secretary presented the following report of the Convention of Delegates held at Paris, February 18, 1925:

TRANSACTION OF THE CONVENTION OF DELEGATES, PARIS, ILLINOIS, FEBRUARY 18, 1925.

To the Convention of Delegates, Illinois Farmers' Institute, Paris, Illinois:

GENTLEMEN: We, your committee on Credentials, beg leave to report that we have examined the credentials of the delegates representing the various congressional districts (the even-numbered districts being the only districts to elect Directors this year) and find the following named persons entitled to seats in this convention:

REPORT OF DELEGATES.

The delegates representing the even-numbered congressional districts held their elections and reported to the convention the election of Directors for the ensuing term as follows:

2nd District. August Geweke, DesPlaines.
4th District. H. Clay Calhoun, 915 Lumber Exc. Bldg., Chicago.
6th District. L. C. Brown, LaGrange.
8th District. Arthur C. Page, 523 Plymouth Ct., Chicago.
10th District. John E. Barrett, Prairie View.
12th District. Geo. F. Tullock, Rockford.
14th District. Geo. A. Switzer, Macomb. (No election.)
16th District. Ralph Allen, Delavan.
18th District. F. I. Mann, Gilman.
20th District. G. G. Hopping, Havana.
22nd District. E. W. Burroughs, Edwardsville.
24th District. Everett Veatch, Norris City.

The *ex officio* Directors are:

Superintendent of Public Instruction, F. G. Blair, Springfield.
Dean of the College of Agriculture, H. W. Mumford, Urbana.
Director State Department of Agriculture, B. M. Davison, Springfield.
President State Horticultural Society, J. B. Burrows, Decatur.
President State Dairymen's Association, W. S. O'Hair, Paris.

On motion, the election of Directors was unanimously approved and the convention adjourned.

Respectfully submitted,
H. E. YOUNG, *Secretary of Convention.*

On motion the report was received and placed on file.

No other business appearing, the Board adjourned and the New Board convened, President Allen presiding.

Present: Directors Allen, Barrett, Blair, Brown, Burroughs, E. W., Calhoun, Curtiss, Davison, Geweke, Goodwin, Gray, Gregory, Haynes, Hopping, Hufford, Mann, Mason, Maxcy, Mumford, O'Hair, Pickett, Reed, Schilling, Switzer, Tullock, Veatch, Webb and Wilson.

On motion the election of officers was made the next order of business.

The Chairman appointed Directors Switzer, Hopping and Schilling as tellers and the balloting proceeded, resulting in the election of the following officers for the ensuing year:

President, L. C. Brown.
Vice-President, W. G. Curtiss.
Secretary, H. E. Young.
Auditor-Treasurer, Clayton C. Pickett.

On motion, Mrs. H. A. McKeene was reelected Secretary of the Department of Household Science.

Moved by Director Haynes that any Directors finding it necessary to leave prior to the balloting on the location of the next Annual Meeting be permitted to record his vote on the location with the Secretary to be counted on the ballots as taken. Seconded and carried.

On motion, recess was taken until 1:15 P. M.

AFTERNOON SESSION.

The Board reconvened at the appointed hour, retiring President Allen and calling President-Elect Brown to the chair. President Brown thanked the Members of the Board for the honor conferred upon him and pledged his best service to the interest of the Institute during his administration.

Delegations from Peoria, Quincy and Waukegan were present, and each presented invitations for entertaining the next Annual Meeting of the State Institute. Director Mason presented an invitation from Bloomington and Director Mann an invitation from Kankakee.

Moved that the Board proceed to ballot on the location of the next Annual Meeting, the first ballot being informal. Seconded and carried.

The result of the first formal ballot showed sixteen votes for Quincy, six for Peoria, three for Waukegan and one for Bloomington. On motion, duly made and seconded, Quincy was made the unanimous choice providing the executive committee found that the facilities offered for entertaining this meeting are adequate.

Moved by Director Haynes that the executive committee be authorized to visit Quincy to investigate its facilities for entertaining the next State Meeting, and that if in the judgment of this committee the accommodations are found adequate, to formally accept the invitation and perfect arrangements accordingly. Seconded and carried.

Moved by Director Burroughs that the revision of the Speakers' list be referred to the Executive Committee with power to act. Seconded and carried.

The matter of publishing some of the Paris addresses in bulletin form was discussed and the Secretary was authorized to proceed with the printing of those which in his judgment should have such attention.

On motion, the Board adjourned subject to the call of the President.

Respectfully submitted,

H. E. Young, *Secretary.*

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE HELD AT QUINCY, MAY 24, 1925.

Pursuant to the call of the President, a Meeting of The Executive Committee was held at Quincy, May 24, 1925.

Present: Directors Brown, Allen, Burroughs, Curtiss, Haynes, and Pickett.

The Committee inspected the facilities offered for the holding of the Annual State Meeting, February, 1926, and conferred with representatives of the Chamber of Commerce, County Farmers' Institute and County Farm Bureau regarding detailed arrangements and program. The auditorium of the Washington Square Theater, the Methodist Church and the Presbyterian Church were found to be conveniently located and well equipped as meeting places for both the Institute and the Department of Household Science. The local committee, however, were not prepared to assure the use of the Washington Square Theater, although the Churches, the Armory and a less desirable Theater were offered. In the judgment of the executive committee the Washington Square Theatre was the only building which could adequately accommodate the evening meetings and unless it was available, the members of the committee felt that the facilities offered by Quincy were not all that they should be in view of the Institute requirements as demonstrated at the Paris, Dixon, and Belleville meetings.

Moved by Director Haynes that the matter of halls be left open for thirty days in order to give the local committee time to negotiate for the Washington Square Theater, and that final acceptance of Quincy's invitation be deferred pending the result of such negotiations. Seconded and carried.

Hotel accommodations which were offered seemed to be acceptable on the part of the committee.

On motion, the committee reconvened after lunch and held an executive session at the hotel at 1:30 P. M. After further decision of the situation, the Secretary was authorized to complete arrangements as in his judgment might seem best, with the understanding that every possible effort should be made to secure the Washington Square Theater and one of the Churches for the use of the Meeting. In case, the Theater was not available the Secretary was authorized to perfect the best arrangements possible, but not until he was satisfied that the local committee had made every possible effort to secure same.

On motion, duly made and carried, the week of February 22d was definitely decided upon for the meeting, Tuesday, Wednesday and Thursday,

February 23, 24 and 25, or Wednesday, Thursday and Friday, February 24, 25 and 26, which ever date might prove best in meeting the local conditions and arrangements as later decided upon.

On motion the committee adjourned.

Respectfully submitted,

H. E. Young, *Secretary.*

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS, HELD AT THE UNIVERSITY OF ILLINOIS, URBANA, JUNE 25, 1925.

Pursuant to the call of the President, a meeting of the Board of Directors was held at the University of Illinois, Urbana, June 25, 1925.

In the absence of President Brown and Vice-President Curtiss, Director Allen was chosen as Chairman of the Meeting.

Present: Directors Allen, Barrett, Burrows, J. B., Geweke, Goodwin, Hopping, Hufford, Mumford, Pickett, Reed, Switzer, Tullock, Veatch, and Webb.

The Secretary read a telegram and letter from President Brown advising that he was unable to be present on account of his wife's illness, and stated that Director of Agriculture Stanard, a new ex-officio Member of the Board, sent personal greetings and regretted that it was impossible for him to meet with the Members at this time.

Minutes of the previous Board Meeting and Meeting of the Executive Committee were read and approved.

The Secretary reported the following report:

To the Board of Directors:

Regarding the Quincy situation, to which reference was made in the minutes of the executive committee, further negotiations have resulted in what, in my judgment, seems a very satisfactory arrangement as to the use of halls for our February Meeting.

About two weeks after your committee visited Quincy, the local Committee advised that they had, with difficulty, succeeded in getting the Theater Management to say that they would give them the use of the Theater for Thursday and Friday, day and night sessions, for $700. They also reported that the Empire Theater could be had for three days and two nights for $500 and could be obtained for Tuesday, Wednesday and Thursday or Wednesday, Thursday and Friday and asked that we decide on these two propositions.

In answer to this proposition they were advised that it would be impractical for us to hold our meeting on Thursday, Friday and Saturday and, therefore, the use of the Washington Square Theater for Thursday and Friday would be impossible from our standpoint; further that the Empire Theater would not meet our requirements and that, in the judgment of our Committee, the Washington Square Theater was the only auditorium that would satisfaitorily accommodate our Meeting. It was further stated that, if they would secure the Washington Square Theater for Tuesday and Wednesday, day and evening sessions, that it might be possible for us to hold our forenoon session on Thursday at the Methodist Church. This suggestion was made to Mr. Wade just before leaving, the day the Committee met with them but they evidently had not considered same or preferred to endeavor to persuade us to accept the Empire Theater. In my letter, it was made very plain that we could not do this and that only the use of the Washington Square Theater, for at least the first two days, would be acceptable. After this kind of an answer, they got busy and advised that they would secure the Washington Square Theater for our use for Tuesday and Wednesday, February 23 and 24.

Soon after receiving this advice, your Secretary again went to Quincy and completed final arrangements with Mr. Wade, of the Chamber of Commerce, and Mr. Miller, the County Adviser, as follows:

We will use the Washington Square Theater, February 23 and 24, day and evening sessions; the Presbyterian Church, the morning session

of the 25th and the Methodist Church, February 23 and 24 and the morning of the 25th for the Household Science Department Meeting and the general session the afternoon of the 25th.

Detailed arrangements regarding the Hotel accommodations were also made with Hotel Quincy as Institute headquarters. A conference was had with the Hotel Manager and was given every assurance that we will be well taken care of. He agreed to give us the bulk of our rooms at the Quincy, diverting its regular trade to the Newcomb, their other hotel, and I am sure will make good in every respect, as he is much interested in the meeting and willing to make every concession and accommodations which will suit us best.

We also had a complete understanding regarding advertising, committees, program features, which they are to supply, etc.

We feel that matters have worked out very nicely at Quincy. Their interest has grown considerably since the Committee was there and they are on "their toes" in good shape. It appears that they are going to make good in every respect and that there will be the very best of support and co-operation from that end. The way both Mr. Wade and Mr. Miller have been taking hold of the proposition since our first meeting with them is particularly pleasing and we came away feeling that the local situation, from every standpoint, offers just about the best prospects we have had at any place for an outstanding successful Institute Meeting. We are delighted with the way things have worked out and believe we are going to have a record-breaking Meeting at Quincy and that is saying a good deal, after our experience at Paris this year.

It is hoped my action in regard to hall arrangements may meet the approval of the Executive Committee and also that of the board members.

Immediately following the Annual Meeting of the Board of Directors at Springfield, March 3d, the schedules for the annual spring conferences in the various congressional districts were issued and mailed to the Board Members and to the county institute officers, the officers of the Household Science Departments of the County Institutes, the county farm and home advisers, and to the County Superintendents of Schools. These conferences were all held as per schedule, with the exception of the one called for Carbondale, April 3d, but which, owing to the tornado relief work, was postponed to April 25. The attendance at all of these conferences was excellent, every county with the exception of three being very well represented. Preliminary schedules were made for both county and local institutes and the detail work of arranging these schedules and the assignment of speakers is progressing as rapidly as possible. It is expected that this work may be completed within the next few weeks and that the copy for the new annual bulletin may be in the hands of the printer the latter part of July in order that the bulletins may be available for distribution very soon after August 1st. Detail report of the schedules will be made at the Board's September Meeting.

The general Institute bill, in accordance with the budget accepted by the State Finance Department and recommended to the General Assembly by the Governor in the State Budget was passed by the House and Senate during May, was signed by the Governor on June 5th, and will become effective July 1st. Our new appropriations provided in this bill are for use during the two fiscal years beginning July 1, 1925 and ending June 30, 1927. Advice has already been received from the State Auditor regarding the Classification of the funds for the next biennial, and which become available the first of next month.

In this connection, it should be remembered that all expense accounts must be in this month in order to be taken care of out of the funds appropriated for the current biennial. Expenses incurred during one biennial can not be paid from appropriations made for the following biennial. This applied to all of the various Institute funds, including the County Institute fund. To date, all of the County Reports, with one exception, have been received and warrants covering same have either already gone forward to

the County Institute Treasurers or will be included in this month's accounts and be sent soon after the first. The one County, whose report has not yet been received, is DeKalb, and they have been advised that it must be filed within the next few days, if their County expenses covering the past year is to be paid.

The work of completing and editing the Annual Report is well under way and will be completed as early as possible after the close of the fiscal year, June 30. Every effort will be made to have the copy ready for the printer by the middle of July and to have the volume printed as rapidly and as soon thereafter as conditions permit.

Suggestions relative to the Annual Meeting program for Quincy are requested from Members and all are urged to give the matter serious thought with a view of assisting the Executive Committee in preparing the strongest program possible.

Respectfully submitted,

H. E. Young, *Secretary.*

On motion the report was accepted and placed on file.

The Secretary reported the following committee appointments by the President.

Executive: Ralph Allen, W. G. Curtiss, Clayton C. Pickett, Frank S. Haynes, and E. W. Burroughs.

Auditing: Chas. Gray, August Geweke and G. G. Hopping.

Legislative: Frank S. Haynes, F. I. Mann, E. W. Burroughs, Clayton C. Pickett, and Harry Wilson.

Household Science: S. B. Mason, W. G. Curtiss, Wm. Webb, C. V. Gregory, and H. Clay Calhoun.

Secondary Education in Agriculture and Household Science: A. C. Page, L. F. Maxcy, F. G. Blair, H. W. Mumford, and Adam Schilling.

Highways: E. W. Burroughs, N. F. Goodwin, Geo. A. Switzer, John E. Barrett, and Ira B. Reed.

Agricultural Books: H. W. Mumford, A. C. Page, F. C. Blair, Everett Veatch, and John L. Hufford.

Entomology: A. C. Page, L. F. Maxcy, Geo. F. Tullock, Wm. Webb and W. G. Curtiss.

Soil Investigations and Experiments: Ralph Allen, Geo. F. Tullock, F. I. Mann, A. N. Abbott, and N. F. Goodwin.

On motion duly made and carried, the Board confirmed the committee appointments.

Director Allen reported that no action had yet been taken by the University Board of Trustees regarding the continuance of the Agricultural Hall of Fame as suggested by the Institute nearly two years ago, and suggested that a committee be named to again wait upon the Trustees regarding the matter.

Director Tullock moved that a committee of five, including the Chairman, be named for this purpose. Seconded and carried.

Director Mumford suggested that this committee confer with President Kinley, prior to appearing before the Board of Trustees.

Director Mumford called attention to the present situation relative to the use of federal funds for experimental purposes and outlined the plans under which these funds are being expanded with reference to the various lines of work already underway. He also spoke of the co-operation now existing between the various state experiment stations throughout the country, particularly in regard to lines of experimental work in agriculture, rural organization and Home Economics.

The Chairman named the following members of the Committee on the Illinois Hall of Fame:

President Brown, Directors Blair, O'Hair and Burrows.

On motion the Board adjourned, the remainder of the day being devoted to an inspection of the University Soil and Crop Experiment Fields, the Animal Husbandry and Dairy Departments, the Horticultural Grounds and the various University and Experiment Station Laboratories. This inspection was made under the guidance of the Heads of the various Departments, assisted by Members of the teaching and experimental staffs, and proved intensely interesting and profitable to all Members.

Respectfully submitted,

H. E. Young, *Secretary.*

AUDITOR'S REPORT.

To the Board of Directors of the Illinois Farmers' Institute.

GENTLEMEN: As your auditor, I beg leave to report that I have duly examined the claims of the parties named below; that I approve the same and recommend that warrants in payment of said vouchers be drawn for the following amounts:

Voucher No.	To whom.	For what.	Fund No.	Amount.
680	July Salaries	Office help	1	$726 66
681	Central Illinois Public Service Co.	Ice supply	2	1 40
682	Catherine Driscoll	Extra office help	2	30 00
683	McCoy Laundry Company	Cleaning one flag	2	26
684	Springfield Clean Towel Service	Towel supply	2	1 25
685	Illinois Bell Telephone Company	Telephone service	2	7 40
686	Brother Leo	Speakers' fees	5	40 00
687	L. M. Smith	do	5	30 00
688	O. J. Sommer	do	5	10 00
689	J. B. Rice	do	5	10 00
690	J. W. Stanton	do	5	10 00
691	Leigh F. Maxcy	Institute Officers' expense	6	9 03
692	W. G. Curtiss	do	6	37 97
693	Wm. Webb	do	6	53 33
694	W. S. O'Hair	do	6	21 05
695	G. G. Hopping	do	6	13 07
696	H. E. Young	do	6	31 36
697	Harry Wilson	do	6	18 72
698	County Institutes	County Institute expense	7	225 00
	H. J. Cutler	Christian Co. $75 00		
	Geo. B. Goss	DuPage Co. 75 00		
	E. H. Brucker	Monroe Co. 75 00		
699	August Salaries	Office help	1	726 66
700	Central Illinois Public Service Co.	Ice supply	2	1 75
701	Wm. H. Conkling	Postage	2	100 00
702	Illinois Bell Telephone Co.	Telephone service	2	10 00
703	Springfield Clean Towel Service	Towel supply	2	1 25
704	Western Union Telegraph Co.	Telegraph service	2	45
705	Edwin Bay	Speakers' fees	5	10 00
706	J. R. Midyette	do	5	40 00
707	Wm. E. D. Rummel	do	5	40 00
708	Dr. Eva M. Wilson	do	5	40 00
709	Margaret E. Brooks	do	5	10 00
710	Western Union Telegraph Co.	Telegraph service	2	1 03
711	September Salaries	Office help	1	726 66
712	R. H. Armbruster Mfg. Co.	Tent and chairs	2	20 00
713	Wm. H. Conkling	Postage	2	150 00
714	George Johnston	Drayage	2	16 50
715	Central Illinois Public Service	Ice supply	2	1 40
716	Illinois Bell Telephone Co.	Telephone service	2	4 10
717	Springfield Clean Towel Service	Towel supply	2	1 25
718	Sam Crabtree	Speakers' fees	5	10 00
719	A. C. Everingham	do	5	20 00
720	F. A. Gougler	do	5	10 00
721	Prof. L. F. Graber	do	5	20 00
722	Dr. Eva M. Wilson	do	5	10 00
723	Ralph Allen	Institute Officers' expense	6	26 26
724	H. Clay Calhoun	do	6	25 16
725	Chas. Gray	do	6	16 01
726	C. V. Gregory	do	6	18 96
727	C. C. Pickett	do	6	22 76
728	Geo. F. Tullock	do	6	52 03
729	H. E. Young	do	6	14 36
730	County Institutes	County Institute expense	7	75 00
	L. Kimmel	Pope County $75 00		
731	October Salaries	Office help	1	726 66
732	Central Illinois Public Service Co.	Ice supply	2	1 40
733	Wm. H. Conkling	Postage	2	100 00
734	Hodge Tire & Supply Co.	Light bulbs	2	2 20

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
735	Illinois Bell Telephone Co.	Telephone service	2	13 30
736	Springfield Clean Towel Service	Towel service	2	1 25
737	Western Union Telegraph Co.	Telegraph service	2	3 94
738	H. H. Bailey	Speakers' fees	5	30 00
739	Margaret E. Brooks	do	5	90 00
740	Mrs. E. W. Carrier	do	5	10 00
741	Sam W. Crabtree	do	5	50 00
742	L. A. Daily	do	5	20 00
743	Mamie Dentler	do	5	50 00
744	Mrs. Frederick A. Dow	do	5	50 00
745	Mrs. H. G. Easterly	do	5	10 00
746	A. C. Everingham	do	5	70 00
747	Chas. FitzHenry	do	5	30 00
748	Chas. Foss	do	5	20 00
749	L. F. Graber	do	5	40 00
750	H. B. Green	do	5	20 00
751	Mary I. Hickman	do	5	30 00
752	Wm. Osburn	do	5	10 00
753	E. S. Priest	do	5	10 00
754	Mrs. W. W. Ramsey	do	5	10 00
755	L. E. Rast	do	5	20 00
756	I. P. Trotter	do	5	10 00
757	G. R. Williams	do	5	10 00
758	A. S. Cuthbertson	do	5	30 00
759	E. E. Pifer	do	5	30 00
760	Wm. E. D. Rummel	do	5	50 00
761	Wm. Webb	Institute Officers' expense	6	15 14
762	Arthur C. Page	do	6	21 61
763	H. E. Young	do	6	33 12
764	County Institutes	County Institute expense	7	75 00
	Charles W. Frame	Sangamon	$75 00	
765	November Salaries	Office help	1	726 66
766	American Railway Express Co.	Express service	2	164 83
767	Central Illinois Public Service Co.	Ice supply	2	1 75
768	Wm. H. Conkling	Postage	2	100 00
769	Illinois Bell Telephone Co.	Telephone service	2	16 95
770	Individual Drinking Cup Co.	Drinking cups	2	2 40
771	F. J. Robinson	Hauling books	2	64 50
772	Springfield Clean Towel Service	Towel supply	2	1 25
773	Western Union Telegraph Co.	Telegraph service	2	7 15
774	John Acheson	Speakers' fees	5	60 00
775	Mrs. Franklin Adams	do	5	30 00
776	Margaret E. Brooks	do	5	90 00
777	R. E. Caldwell	do	5	50 00
778	Mrs. E. W. Carrier	do	5	20 00
779	Sam W. Crabtree	do	5	10 00
780	C. P. Dadant	do	5	30 00
781	L. A. Daily	do	5	20 00
782	W. P. Dearing	do	5	30 00
783	Mrs. H. M. Dunlap	do	5	70 00
784	A. C. Everingham	do	5	80 00
785	Chas. Foss	do	5	30 00
786	Lyle W. Funk	do	5	10 00
787	Mrs. Ernest Giehl	do	5	20 00
788	L. F. Graber	do	5	10 00
789	H. P. Irish	do	5	20 00
790	E. B. Landis	do	5	60 00
791	F. I. Mann	do	5	90 00
792	Lena S. Mann	do	5	230 00
793	Mrs. J. L. Murray	do	5	160 00
794	Catherine Hickox Paget	do	5	30 00
795	Mrs. E. H. Perisho	do	5	100 00
796	E. E. Pifer	do	5	30 00
797	E. S. Priest	do	5	50 00
798	Henry E. Rompel	do	5	10 00
799	G. R. Williams	do	5	100 00
800	Eva M. Wilson	do	5	240 00
801	Olive Young	do	5	10 00
802	Chas. W. Borgelt	do	5	50 00
803	Mrs. E. W. Burroughs	do	5	20 00
804	Chas. FitzHenry	do	5	10 00
805	Henry R. Rathbone	do	5	10 00
806	Wm. E. D. Rummel	do	5	100 00
807	Wm. Webb	do	5	100 00
808	Geo. A. Switzer	Institute Officers' expense	6	27 32
809	C. C. Pickett	do	6	20 76
810	County Institutes	County Institute expense	7	1,042 41
	Henry Vollmer	Adams Co.	$75 00	
	Ernest Holsapple	Cumberland Co.	75 00	

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
	W. P. Glass.....Hamilton Co..... 75 00			
	John A. Wilson....Jackson Co..... 68 27			
	R. L. Eyman.....Jersey Co..... 75 00			
	J. G. McCall.....Johnson Co..... 75 00			
	Chas. F. Worner..Mason Co..... 75 00			
	August Meyer ....Massac Co..... 75 00			
	Dr. Oscar Allen....Peoria Co..... 75 00			
	Frank W. Keith....Perry Co..... 75 00			
	Mrs. J. A. Worthington.....Union Co..... 74 14			
	Guy F. Molt.....Wayne Co..... 75 00			
	Chas. F. DeBoard..White Co..... 75 00			
	John A. Love.....Hardin Co..... 75 00			
811	December Salaries	Office help	1	726 66
812	Western Union Telegraph Co.	Telegraph service	2	3 77
813	American Express Co.	Express service	2	2 93
814	Burroughs Adding Machine Co.	Adding Machine repair work	2	4 46
815	Central Illinois Public Service	Ice supply	2	1 40
816	Wm. H. Conkling	Postage	2	150 00
817	Illinois Bell Telephone Co.	Telephone service	2	19 70
818	Springfield Clean Towel Service	Towel supply	2	1 25
819	Nena W. Badenoch	Speakers' fees	5	10 00
820	H. H. Bailey	do	5	30 00
821	Margaret E. Brooks	do	5	90 00
822	Mrs. J. M. Daniels	do	5	30 00
823	Mamie Dentler	do	5	50 00
824	Mrs. Frederick A. Dow	do	5	100 00
825	A. C. Everingham	do	5	70 00
826	Lyle W. Funk	do	5	20 00
827	Prof. L. F. Graber	do	5	10 00
828	Prof. Albert A. Hansen	do	5	20 00
829	Julius Klein	do	5	10 00
830	Jane Winker Lighter	do	5	20 00
831	Frank I. Mann	do	5	80 00
832	Lena S. Mann	do	5	60 00
833	C. H. Oathout	do	5	30 00
834	W. S. O'Hair	do	5	20 00
835	Catherine Hickox Paget	do	5	10 00
836	W. O. Peak	do	5	20 00
837	E. S. Priest	do	5	50 00
838	John T. Smith	do	5	10 00
839	Chas. Taylor	do	5	10 00
840	Eva M. Wilson	do	5	150 00
841	L. H. Beeler	do	5	60 00
842	Wm. E. D. Rummel	do	5	10 00
843	W. J. Dugan	do	5	30 00
844	Mrs. W. J. Dugan	do	5	30 00
845	W. G. Curtiss	Institute Officers' expenses	6	12 21
846	F. I. Mann	do	6	44 20
847	Frank S. Haynes	do	6	23 83
848	G. G. Hopping	do	6	28 87
849	Mrs. H. A. McKeene	do	6	35 56
850	John L. Hufford	do	6	23 01
851	W. S. O'Hair	do	6	22 25
852	H. E. Young	do	6	57 38
853	County Institutes	County Institute expense	7	1,313 71
	Fred A. Long.....Calhoun Co.....$75 00			
	L. E. Stoutenberg..Clay Co..... 75 00			
	Fred J. Roosevelt..Edwards Co..... 75 00			
	Kelly E. Moye.....Gallatin Co..... 75 00			
	Chas. McMillan....Henderson Co.... 75 00			
	Geo. A. Switzer....McDonough Co... 75 00			
	Walter Fox.....Pike Co..... 60 33			
	V. W. Spann.....Alexander Co..... 75 00			
	C. J. Leinbach.....Boone Co..... 75 00			
	Roy R. Duncan.....Crawford Co..... 75 00			
	Wm. H. Gray.....Fayette Co..... 75 00			
	James Faulkner....Hancock Co..... 56 00			
	Sam W. Jones.....Jefferson Co..... 75 00			
	Joseph Schwartz...Marion Co..... 72 38			
	F. L. Graves.....Pulaski Co..... 75 00			
	Pete T. Baker.....Saline Co..... 75 00			
	H. B. Thurston.....Stark Co..... 75 00			
	Clifton Wood.....Wabash Co..... 75 00			
854	January Salaries	Office help	1	726 66
855	Central Illinois Public Service	Ice supply	2	1 40
856	Wm. H. Conkling	Postage	2	150 00
857	Geo. W. Hudson	Rubber stamps	2	3 00
858	Illinois Bell Telephone Co.	Telephone service	2	25 80

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
859	Illinois Office Outfitters	Bostitch & Stapling Machine	2	6 50
860	George Johnston	Drayage	2	14 00
861	Springfield Clean Towel Service	Towel supply	2	1 25
862	The Western Union Telegraph Co.	Telegraph service	2	3 91
863	L. H. Beeler	Speakers' fees	5	10 00
864	H. A. Bone	do	5	10 00
865	Margaret E. Brooks	do	5	100 00
866	Mamie Dentler	do	5	10 00
867	A. C. Everingham	do	5	80 00
868	Chas. FitzHenry	do	5	60 00
869	E. B. Landis	do	5	60 00
870	J. P. Mason	do	5	10 00
871	J. R. Midyette	do	5	30 00
872	Mrs. E. H. Perisho	do	5	30 00
873	Walter Rowe	do	5	30 00
874	H. A. Winter	do	5	50 00
875	Mrs. H. A. McKeene	Institute Officers' expense	6	17 37
876	Geo. A. Switzer	do	6	21 38
877	Ira B. Reed	do	6	4 91
878	Frank S. Haynes	do	6	43 41
879	H. E. Young	do	6	39 50
880	County Institutes	County Institute expense	7	1,417 12
	T. W. May.....Bureau Co..... $75 00			
	R. E. Fannig.....Cass Co..... 75 00			
	Pearl Robinson....Franklin Co..... 75 00			
	John Schroeder....Iroquois Co..... 75 00			
	Geo. W. Corbin....Jasper Co..... 69 94			
	L. S. Griffith.....Lee Co..... 75 00			
	H. M. Zeter.....Logan Co..... 75 00			
	C. L. Whitlock.....Montgomery Co.. 75 00			
	H. C. Knoeppel.....Scott Co..... 75 00			
	J. H. Swanzey.....Stephenson Co... 75 00			
	Louis J. Stahl.....Tazewell Co..... 75 00			
	F. V. Wilson.....Effingham Co..... 75 00			
	John H. Daget.....Clinton Co..... 72 18			
	Chas. M. Weller....Douglas Co..... 75 00			
	Crescent O'Connor.Knox Co..... 75 00			
	J. W. Hall.....Macoupin Co..... 75 00			
	Geo. S. Hoff.....Vermilion Co.... 75 00			
	A. C. Barr.....Warren Co..... 75 00			
	W. K. Galeener.... Williamson Co... 75 00			
881	February Salaries	Office help	1	726 66
882	American Railway Express Co.	Express charges	2	3 02
883	Central Illinois Public Service	Ice supply	2	1 75
884	Wm. H. Conkling	Postage	2	200 00
885	Hodge Tire & Supply Co	Light bulb	2	75
886	Ill. Bell Telephone Co.	Telephone service	2	4 65
887	Macpherson & Edward	Ribbon for badges	2	7 73
888	Springfield Clean Towel Service	Towel supply	2	1 25
889	Western Union Telegraph Co.	Telegraph service	2	7 48
890	C. G. Simpson	Packing books	2	62 50
891	A. N. Abbott	Speakers' fees	5	20 00
892	Mrs. Franklin Adams	do	5	10 00
893	C. A. Bracy	do	5	20 00
894	L. C. Brown	do	5	50 00
895	W. S. Campbell	do	5	10 00
896	Mrs. E. W. Carrier	do	5	20 00
897	A. S. Cuthbertson	do	5	20 00
898	Mrs. J. M. Daniels	do	5	20 00
899	W. P. Dearing	do	5	20 00
900	Mamie Dentler	do	5	50 00
901	L. S. Dorsey	do	5	30 00
902	Mrs. H. M. Dunlap	do	5	50 00
903	A. C. Everingham	do	5	130 00
904	Chas. FitzHenry	do	5	30 00
905	Chas. Foss	do	5	30 00
906	L. F. Graber	do	5	10 00
907	Grace Viall Gray	do	5	40 00
908	Mrs. Elizabeth Gumm	do	5	90 00
909	Mrs. J. C. Hanna	do	5	10 00
910	Otis Kercher	do	5	10 00
911	E. B. Landis	do	5	30 00
912	Jane Winter Lighter	do	5	50 00
913	Lena S. Mann	do	5	120 00
914	William Osburn	do	5	20 00
915	Wm. E. D. Rummel	do	5	70 00
916	Dr. Lena K. Sadler	do	5	40 00
917	Minnie G. Stearns	do	5	10 00
918	Wm. Webb	do	5	80 00

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
919	Mrs. W. W. Ramsey	do	5	20 00
920	J. R. Midyette	State Meeting expense	6	10 00
921	Martin H. Schaeffer	do	6	10 00
922	W. L. Mills	do	6	10 00
923	Mary E. Sweeney	do	6	50 00
924	John W. Gorby	do	6	50 00
925	Mrs. Frederick A. Dow	do	6	10 00
926	Mabel L. Evans	do	6	10 00
927	Mrs. Anna J. Peterson	do	6	10 00
928	G. C. Johnstone	do	6	10 00
929	R. E. Caldwell	do	6	10 00
930	John Evvard	do	6	40 00
931	Rowena Morse Mann	do	6	50 00
932	H. O. Pritchard	do	6	50 00
933	Mabel Dunlap	do	6	15 00
934	Helen Ruggles	do	6	40 00
935	Mary L. Matthews	do	6	25 00
936	D. E. Hale	do	6	20 00
937	Kathryn Romig McMurray	do	6	60 00
938	Geo. W. Willett	do	6	25 00
939	Mrs. Lawrence T. Foster	do	6	25 00
940	Rowena Morse Mann	do	6	19 75
941	M. Attie Souder	do	6	8 22
942	Mamie Dentler	do	6	18 66
943	Margaret E. Brooks	do	6	16 22
944	Fred L. Petty	do	6	29 07
945	Mary L. Matthews	do	6	18 65
946	Mrs. Geo. Eastburn	do	6	17 14
947	H. O. Pritchard	do	6	10 18
948	Mrs. S. E. Bradt	do	6	11 00
949	A. N. Abbott	do	6	31 36
950	W. G. Curtiss	Institute Officers' expense	6	35 23
951	Clayton C. Pickett	do	6	24 32
952	Wm. Webb	do	6	28 22
953	John S. Fleming	State Meeting expense	6	33 00
954	H. E. Young	Institute Officers' expense	6	52 26
955	H. W. Mumford	do	6	7 15
956	Mrs. H. A. McKeene	do	6	26 25
957	G. W. Willett	State Meeting expense	6	19 09
958	L. H. Smith	do	6	7 05
959	Mrs. W. W. Ramsey	do	6	15 45
960	J. R. Midyette	do	6	17 55
961	C. E. Hopkins	do	6	18 77
962	D. E. Hale	do	6	15 02
963	John W. Gorby	do	6	19 96
964	Martin H. Schaeffer	do	6	12 63
965	Grace Viall Gray	do	6	31 01
966	Mrs. Helen Ruggles	do	6	20 40
967	S. B. Mason	Institute Officers' expense	6	29 12
968	County Institutes	County Institute expense	7	1,629 53
	Guy Wolf — Carroll Co.	$75 00		
	Irvin Thorp — DeWitt Co.	75 00		
	Joseph S. Boo — Fulton Co.	75 00		
	Chester P. Winsor — Grundy Co.	75 00		
	Frank Peck — Kane Co.	75 00		
	Oliver Buland — Livingston Co.	75 00		
	George F. Colver — McHenry Co.	60 35		
	John M. Leavy — McLean Co.	75 00		
	Guy L. Kellar — Moultrie Co.	75 00		
	Alva A. Reed — Piatt Co.	69 83		
	Geo. B. Herrick — Shelby Co.	75 00		
	H. Clay Calhoun — Cook Co.	75 00		
	J. H. Martin — Whiteside Co.	75 00		
	W. E. LeMay — Richland Co.	75 00		
	E. H. Brucker — Monroe Co.	75 00		
	E. E. Bishop — Ford Co.	75 00		
	Norman Davis — Greene Co.	74 35		
	L. S. Dorsey — Madison Co.	75 00		
	Arthur Seibert — St Clair Co.	75 00		
	L. F. Ochs — Washington Co.	75 00		
	Frank Brown — Will Co.	75 00		
	J. B. Burrows — Macon Co.	75 00		
969	March Salaries	Office help	1	726 66
970	American Railway Express Co.	Express charges	2	22 30
971	Central Illinois Public Service Co.	Ice supply	2	1 40
972	Ill. Bell Telephone Co.	Telephone service	2	18 35
973	Wm. H. Conkling	Postage	2	100 00
974	Meyer Electric Co.	Light bulb	2	95

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
975	Springfield Clean Towel Service	Towel supply	2	1 25
976	Western Union Telegraph Co	Telegraph service	2	3 87
977	Claude S. Scheckel	Reporting State Meeting	3	641 75
978	L. E. Dallenbach	Speakers' fees	5	110 00
979	Frank I. Mann	do	5	170 00
980	Frank Hersman	do	5	20 00
981	John Acheson	do	5	40 00
982	Mrs. Nena W. Badenoch	do	5	30 00
983	Bertha M. Harris	do	5	120 00
984	Eveline L. Merritt	do	5	10 00
985	C. H. Oathout	do	5	20 00
986	Mrs. William H. Hart	do	5	40 00
987	Mrs. Anna J. Peterson	do	5	10 00
988	W. E. Holben	do	5	20 00
989	Roy S. Rauschkolb	do	5	10 00
990	Wm. Osburn	do	5	110 00
991	Mrs. H. M. Dunlap	State Meeting expense	5	14 52
992	Geo. F. Tullock	Institute Officers' expense	6	60 38
993	C. V. Gregory	do	6	24 96
994	Mrs. George McMahon	State Meeting expense	6	20 49
995	August Geweke	Institute Officers' expense	6	22 44
996	L. C. Brown	do	6	19 56
997	G. G. Hopping	do	6	37 47
998	Frank S. Haynes	do	6	53 50
999	Claude S. Scheckel	State Meeting expense	6	29 19
1000	Wm. Moore	do	6	29 19
1001	G. C. Johnstone	do	6	13 60
1002	John L. Hufford	Institute Officers' expense	6	19 70
1003	F. I. Mann	do	6	38 14
1004	Geo. Switzer	do	6	37 88
1005	R. E. Caldwell	State Meeting expense	6	22 45
1006	Mrs. Frederick A. Dow	do	6	22 92
1007	W. L. Mills	do	6	18 54
1008	Mrs. Lawrence Foster	do	6	10 02
1009	Leigh F. Maxcy	Institute Officers' expense	6	14 44
1010	Chas. Gray	do	6	20 74
1011	W. G. Curtiss	do	6	35 45
1012	Ralph Allen	do	6	65 64
1013	Mary E. Sweeney	State Meeting expense	6	39 33
1014	Lena S. Mann	do	6	27 34
1015	Mrs. F. S. Haynes	do	6	32 03
1016	Harry Wilson	Institute Officers' expense	6	14 55
1017	Mabel L. Evans	State Meeting expense	6	14 73
1018	Anna J. Peterson	do	6	23 88
1019	Helen S. Blumenshine	District Conference expense	6	1 65
1020	E. K. Wilcox	do	6	3 01
1021	Mrs. C. B. Zinser	do	6	2 25
1022	Frank N. Coon	do	6	2 25
1023	Oscar Allen	do	6	2 25
1024	T. W. May	do	6	4 77
1025	Anna M. Neer	do	6	4 81
1026	C. A. Johnson	do	6	4 71
1027	Mrs. O. C. Renfer	do	6	1 65
1028	J. E. Garber	do	6	1 65
1029	Lester Spangler	do	6	3 30
1030	Eva E. Howard	do	6	8 79
1031	L. E. McKinzie	do	6	8 51
1032	Mrs. Carl C. Winters	do	6	8 76
1033	Geo. M. Smith	do	6	8 20
1034	Thomas S. Carlin	do	6	6 76
1035	J. R. Shinn	do	6	3 86
1036	Joseph S. Boo	do	6	5 25
1037	L. E. Wilson	do	6	5 65
1038	Cora Roath	do	6	5 77
1039	A. E. Decker	do	6	8 63
1040	Arthur V. Hay	do	6	7 13
1041	Jas. Faulkner	do	6	5 77
1042	Mrs. W. E. Snow	do	6	4 22
1043	Mrs. Beard Selner	do	6	4 22
1044	J. W. Whisenand	do	6	3 18
1045	J. W. Terpening	do	6	4 27
1046	F. N. Winbigler	do	6	1 99
1047	Mrs. H. L. Blumenshine	do	6	1 65
1048	Glen M. Davis	do	6	1 99
1049	Mrs. J. C. Stewart	do	6	1 99
1050	A. A. Olson	do	6	1 99
1051	E. G. Lewis	do	6	2 73
1052	A. L. Beall	do	6	2 73

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount
1053	Florence L. McGaughey	do	6	3 88
1054	Mrs. M. R. Staggs	do	6	2 73
1055	Mrs. Clarence Watson	do	6	4 38
1056	Mrs. Nellie Flack	do	6	5 06
1057	C. R. Crabb	do	6	4 38
1058	John W. Bailey	do	6	3 66
1059	O. L. Campbell	do	6	1 05
1060	Geo. E. Gentle	do	6	8 51
1061	Mrs. Chas. H. Teel	do	6	8 76
1062	Elmer L. Olsen	do	6	1 29
1063	Mrs. Ira E. Moats	do	6	1 87
1064	C. C. Pickett	Institute Officers' expense	6	22 76
1065	H. Clay Calhoun	do	6	22 94
1066	Mabel Dunlap	State Meeting expense	6	10 52
1067	Mrs. Hester Allen Carrier	do	6	22 70
1068	W. S. O'Hair	Institute Officers' expense	6	40 95
1069	Julius Kline	District Conference expense	6	11 70
1070	George L. Vollmer	do	6	11 70
1071	Margaret Lanigan	State Meeting expense	6	10 52
1072	Emma C. Burroughs	do	6	51 46
1073	Mrs. H. A. McKeene	Institute Officers' expense	6	33 63
1074	E. W. Burroughs	do	6	80 72
1075	H. E. Young	do	6	38 23
1076	County Institutes	County Institute expense	7	660 00
	Z. B. White—Coles Co—$75 00			
	Chester Smithkamp—Edgar Co—60 00			
	W. E. Snow—Henry Co—75 00			
	J. P. Carson—JoDaviess Co—75 00			
	A. J. Stahl—Lake Co—75 00			
	J. J. Hornung—LaSalle Co—75 00			
	Lester Spangler—Marshall Co—75 00			
	George Johns, Jr.—Winnebago Co—75 00			
	A. G. Goepper—Kankakee Co—75 00			
1077	A. J. Bill	Speakers' fees	5	10 00
1078	Margaret E. Brooks	do	5	60 00
1079	Sam Crabtree	do	5	40 00
1080	Brother Leo	do	5	30 00
1081	Mrs. Katherine Hawthorne Welsh	do	5	60 00
1082	April Salaries	Office help	1	726 66
1083	American Railway Express Co.	Express charges	2	210 83
1084	Central Ill. Public Service	Ice supply	2	1 40
1085	Illinois Bell Telephone Co.	Telephone service	2	5 15
1086	Springfield Clean Towel Service	Towel service	2	1 25
1087	Western Union Telegraph Co.	Telegraph service	2	3 47
1088	H. H. Bailey	Speakers' fees	5	10 00
1089	Mrs. E. W. Carrier	do	5	10 00
1090	R. R. Hills	do	5	20 00
1091	Chas. Keltner	do	5	50 00
1092	Fred L. Petty	do	5	20 00
1093	Mrs. J. H. Rainey	do	5	10 00
1094	C. Carroll Smith	do	5	10 00
1095	Mrs. Edna Flick	District Conference expense	6	4 52
1096	Frank N. Barrett	do	6	3 01
1097	Otis B. Van Winkle	do	6	1 71
1098	Lena Korty	do	6	2 03
1099	Mrs. Henry Knoeppel	do	6	2 03
1100	Mrs. Arthur L. Van Winkle	do	6	1 71
1101	Elmer G. Vortman	do	6	2 03
1102	Howard Jokisch	do	6	2 77
1103	George W. Solomon	do	6	3 00
1104	Milton Green	do	6	1 48
1105	Mrs. C. L. Raney	do	6	1 21
1106	Raymond R. Hills	do	6	2 85
1107	C. W. Frame	do	6	1 21
1108	G. A. Wolford	do	6	1 21
1109	C. L. Whitlock	do	6	3 98
1110	J. H. Rainey	do	6	4 49
1111	O. P. Simpson	do	6	2 60
1112	Bert Rhoades	do	6	5 76
1113	Mrs. T. A. Wilson	do	6	9 70
1114	Mrs. J. R. Krabel	do	6	6 01
1115	Mrs. Martha Calvert	do	6	5 02
1116	Ernest Holsapple	do	6	5 02
1117	Charles Allen	do	6	4 80
1118	Lena M. Trotter	do	6	1 75
1119	Chester R. Boland	do	6	4 51
1120	Mrs. E. H. Perisho	do	6	4 51
1121	Elizabeth Gumm	do	6	4 51

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
1122	Geo. S. Hoff	do	6	2 85
1123	Rose M. White	do	6	1 75
1124	Mrs. Lyle Gilfillan	do	6	6 01
1125	Mrs. C. F. Dueringer	do	6	3 33
1126	Mrs. J. P. Green	do	6	3 55
1127	H. J. Meis	do	6	3 55
1128	John T. Green	do	6	3 55
1129	Ellven J. F. Nelson	do	6	4 57
1130	F. F. Scatterday	do	6	4 57
1131	George T. Swaim	do	6	3 33
1132	Irs B. Reed	Institute Officers' expense	6	53 09
1133	G. G. Hopping	do	6	9 34
1134	W. G. Curtiss	do	6	30 15
1135	L. C. Brown	do	6	25 42
1136	Clayton C. Pickett	do	6	26 77
1137	Frank S. Haynes	do	6	26 20
1138	Mrs. J. Y. Shamel	State Meeting expense	6	19 56
1139	Dr. Eva M. Wilson	do	6	22 45
1140	Geo. H. Wiemer	District Conference expense	6	7 12
1141	H. D. K. Thomas	do	6	2 09
1142	Gladys E. Tuggle	do	6	2 09
1143	Mrs. Frank W. Cline	do	6	2 65
1144	Sam Baxter	do	6	4 49
1145	Mrs. Edgar B. Young	do	6	4 49
1146	Edgar Morrow	do	6	4 49
1147	Mrs. Everett Foreman	do	6	5 09
1148	Mrs. W. D. Green	do	6	2 35
1149	Mrs. Nellie Stonesypher	do	6	2 35
1150	W. T. Wooden	do	6	2 35
1151	Lloyd R. Caldwell	do	6	2 35
1152	John H. Dagit	do	6	3 23
1153	Tony Gildig	do	6	3 23
1154	Joseph Oldfield	do	6	2 46
1155	Mrs. Ida M. Kile	do	6	2 46
1156	Mrs. E. R. LeDoux	do	6	2 46
1157	Wm. H. Gray	do	6	2 46
1158	J. A. Baity	do	6	1 80
1159	W. Edward Hart	do	6	2 90
1160	Geo. W. Henderson	do	6	4 71
1161	F. W. Wascher	do	6	4 71
1162	Harry Ebbert	do	6	5 43
1163	Frank Britton	do	6	1 80
1164	Mrs. A. C. Betebenner	do	6	1 80
1165	W. B. Bunn	do	6	2 30
1166	C. M. Somers	do	6	1 00
1167	G. W. Corbin	do	6	1 00
1168	Edgar Hamilton	do	6	6 30
1169	V. A. Jones	do	6	6 30
1170	R. J. Laible	do	6	1 61
1171	E. M. Phillips	do	6	1 61
1172	Alfred Tate	do	6	1 79
1173	Guy H. Husted	do	6	2 77
1174	Henry B. Roodhouse	do	6	3 01
1175	R. L. Eyman	do	6	4 68
1176	H. J. Steinkuehler	do	6	4 68
1177	D. Craft	do	6	2 46
1178	George Elliott	do	6	5 46
1179	Theo A. Hage	do	6	5 51
1180	Herman A. Lindholm	do	6	5 68
1181	D. E. Warren	do	6	3 19
1182	A. F. Karsk	do	6	1 44
1183	Mrs. B. L. Zipse	do	6	1 75
1184	Mrs. C. C. Ackert	do	6	3 35
1185	Mrs. Amanda Heide	do	6	5 23
1186	Philip G. Lyons	do	6	3 35
1187	Nellie Cahill	do	6	4 49
1188	O. J. Trei	do	6	1 75
1189	Elmer Vietmeir	do	6	1 75
1190	H. B. Price	do	6	5 23
1191	W. G. Heide	do	6	5 23
1192	Mrs. J. H. Martin	do	6	5 23
1193	D. O. Williams	do	6	3 55
1194	Ren Williamson	do	6	2 95
1195	Chas. E. Bickelhaupt	do	6	2 95
1196	G. R. Bliss	do	6	2 95
1197	Mrs. Jesse Colehour	do	6	2 70
1198	Mrs. F. D. Murphy	do	6	3 30
1199	Mrs. D. W. Reints	do	6	1 75

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
1200	J. J. Doerschuk	do	6	3 01
1201	G. F. Varner	do	6	3 25
1202	Mrs. J. G. Cook	do	6	2 84
1203	W. R. Foster	do	6	6 85
1204	J. L. Eustis	do	6	6 85
1205	Charles B. H. Miller	do	6	6 85
1206	Mrs. Ben Fishburn	do	6	6 85
1207	Mrs. P. H. Sanford	do	6	5 97
1208	C. J. Leinbach	do	6	6 41
1209	A. B. Hammond	do	6	6 86
1210	Margaret Greenlee	do	6	7 66
1211	Helen H. Marshall	do	6	7 66
1212	Geo. F. Tullock	do	6	7 41
1213	Fayette S. Rose	do	6	6 91
1214	Mrs. C. B. Watson	do	6	5 70
1215	Charles H. Keltner	do	6	7 66
1216	C. J. Luther	do	6	2 95
1217	F. E. Longmire	do	6	5 23
1218	Wm. S. Lutzow	do	6	5 23
1219	R. W. Carper	do	6	5 86
1220	Belle Walsh	do	6	5 23
1221	Mrs. C. H. Root	do	6	5 23
1222	August Maue	do	6	2 45
1223	E. M. Harris	do	6	2 40
1224	Bert L. Thomas	do	6	4 45
1225	A. J. Gafke	do	6	4 45
1226	Charlotte Fraley	do	6	2 59
1227	Mrs. Collins Goodrich	do	6	2 59
1228	Geo. B. Goss	do	6	2 59
1229	N. W. Lies	do	6	2 59
1230	Harriet J. Francis	do	6	2 45
1231	D. Templeton	do	6	8 82
1232	Nettie L. Carson	do	6	9 92
1233	Lewis A. Morroe	do	6	5 24
1234	O. L. Minter	do	6	5 39
1235	F. F. Homann	do	6	4 53
1236	Frank J. Holub	do	6	2 19
1237	S. S. Davis	do	6	2 51
1238	Clara W. Holub	do	6	2 19
1239	Theodore Roessler	do	6	2 15
1240	J. Frank Stillwell	do	6	2 15
1241	Mrs. Letha R. Killam	do	6	2 15
1242	Mrs. Joe Dietrich	do	6	1 41
1243	Russell Hirsch	do	6	1 29
1244	Mrs. C. C. Hooper	do	6	1 25
1245	C. C. Hendricks	do	6	1 30
1246	Mrs. Jas. J. Ryan	do	6	3 13
1247	Nettie L. Roughton	do	6	3 01
1248	W. S. Elder, Jr.	do	6	3 13
1249	Ralph C. Emel	do	6	2 83
1250	Irvin Thorp	do	6	2 09
1251	Mrs. H. A. McKeene	Institute Officers' expense	6	56 80
1252	County Institutes Geo. B. Goss.....DuPage Co.....	County Institute expense..... $75 00	7	75 00
1253	Mrs. H. A. McKeene	Institute Officers' expense	6	37 55
1254	H. G. Easterly	do	6	16 71
1255	H. E. Young	do	6	140 64
1256	Eva M. Wilson	Speakers' fees	5	190 00
1257	May Salaries	Office help	1	726 66
1258	Illinois Bell Telephone Co	Telephone service	2	3 85
1259	Springfield Clean Towel Service	Towel supply	2	1 25
1260	Toledo Scale Co	Cleaning and adjusting scale	2	13 40
1261	Western Union Telegraph Co	Telegraph service	2	1 49
1262	American Railway Express Co	Express service	2	174 58
1263	Central Ill. Public Service Co	Ice supply	2	1 75
1264	Delia Caldwell	Speakers' fees	5	10 00
1265	Martha Connole	do	5	10 00
1266	John Conyngton	do	5	10 00
1267	C. T. Crofton	do	5	20 00
1268	W. J. Dougan	do	5	10 00
1269	Mrs. Frederick A. Dow	do	5	80 00
1270	Leigh A. Frisbie	do	5	20 00
1271	Mrs. W. J. Fulton	do	5	10 00
1272	Lyle W. Funk	do	5	10 00
1273	T. R. Lovett	do	5	10 00
1274	W. L. Mills	do	5	40 00
1275	Huldah Mueller	do	5	10 00
1276	J. J. Rickeson	do	5	10 00
1277	J. W. Stanton	do	5	10 00

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
1278	L. M. Smith	do	5	40 00
1279	W. E. Riegel	do	5	60 00
1280	Lena S. Mann	do	5	20 00
1281	W. S. Perrine	do	5	10 00
1282	Mrs. J. L. Murray	do	5	20 00
1283	B. W. Tillman	do	5	10 00
1284	Everett M. Veatch	Institute Officers' expense	6	29 92
1285	F. A. Fisher	District Conference expense	6	2 00
1286	Kelly E. Moye	do	6	4 72
1287	C. W. Simpson	do	6	4 72
1288	J. G. McCall	do	6	4 80
1289	Fred Shetler	do	6	4 80
1290	Arvilla Shain Smith	do	6	4 32
1291	George F. Gabel	do	6	5 26
1292	W. R. Bramlet	do	6	2 34
1293	J. E. Whitchurch	do	6	2 34
1294	B. D. Gates	do	6	2 34
1295	H. C. Libkie	do	6	3 00
1296	Albert J. Libkie	do	6	3 00
1297	August Meyer	do	6	8 05
1298	Laura B. Adkins	do	6	8 05
1299	Etta King	do	6	8 05
1300	I. S. Lillie	do	6	8 05
1301	C. A. Field	do	6	9 78
1302	Jno. A. Love	do	6	12 17
1303	W. H. Siefferman	do	6	2 50
1304	Mrs. F. A. Fisher	do	6	2 00
1305	Mrs. Mary Mills	do	6	2 65
1306	Katie M. Schrodt	do	6	2 00
1307	Allen Newkirk	do	6	2 00
1308	Gertrude Grandon	do	6	3 25
1309	Mrs. Maud Dukes	do	6	3 25
1310	Guy F. Molt	do	6	3 25
1311	H. E. Young	Institute Officers' expense	6	16 66
1312	G. A. Spalding	District Conference expense	6	3 25
1313	Robert Wilson	do	6	3 13
1314	Chester Espy	do	6	1 45
1315	Mrs. Harry Ward	do	6	2 55
1316	M. L. Hunt	do	6	2 55
1317	Mrs. Anna L. Maulding	do	6	2 55
1318	Mrs. Alan C. Blood	do	6	2 11
1319	L. Kimmel	do	6	9 78
1320	Ben Schilling	do	6	2 89
1321	Mrs. L. F. Ochs	do	6	2 55
1322	R. E. Schleifer	do	6	2 75
1323	T. E. Allen	do	6	2 75
1324	Martin H. Schaeffer	do	6	3 25
1325	Wm. L. Waters	do	6	5 44
1326	Marie Kolmer	do	6	2 89
1327	Mrs. Wm. A. Hills	do	6	4 17
1328	Marcellus Hartman	do	6	2 89
1329	Theo. E. Reuss	do	6	1 25
1330	Sherman C. Stookey	do	6	1 05
1331	Lee Pierce	do	6	1 55
1332	W. E. Foard	do	6	4 23
1333	Mrs. James M. Vaughn	do	6	4 23
1334	Mrs. W. E. Foard	do	6	4 23
1335	Alfred Raut	do	6	3 25
1336	V. W. Spann	do	6	4 35
1337	Holly C. Marchildon	do	6	4 35
1338	Mrs. V. W. Spann	do	6	4 35
1339	Mrs. Holly C. Marchildon	do	6	4 35
1340	Theo Kueker	do	6	2 63
1341	Chas. W. Webkemeyer	do	6	2 63
1342	Mrs. Geo. W. Hess	do	6	3 00
1343	Mrs. J. A. Worthington	do	6	3 00
1344	Mrs. H. B. Blough	do	6	2 94
1345	Chas. O. Otrich	do	6	1 50
1346	John Conyngton	do	6	2 94
1347	Gilbert Bigham	do	6	2 94
1348	Henry Dunn	do	6	4 35
1349	Stella E. Hutson	do	6	2 15
1350	W. K. Galeener	do	6	1 65
1351	Mrs. W. M. Beattie	do	6	7 84
1352	Mrs. Harry Brubeck	do	6	2 03
1353	Mrs. J. G. Hill	do	6	2 03
1354	Lily Rife	do	6	3 79
1355	Zena Clancy	do	6	3 79
1356	Lena S. Mann	do	6	6 22

AUDITOR'S REPORT—Continued.

Voucher No.	To whom.	For what.	Fund No.	Amount.
1357	E. A. Bierbaum	do	6	4 43
1358	Mrs. H. G. Easterly	do	6	16 31
1359	John E. Barrett	Institute Officers' expense	6	85 67
1360	Harry Wilson	do	6	3 01
1361	Bertha M. Harris	State Meeting expense	6	28 17
1362	John M. Evvard	do	6	62 98
1363	L. C. Brown	Institute Officers' expense	6	17 58
1364	Ralph Allen	do	6	24 84
1365	Mrs. J. L. Murray	State Meeting expense	6	14 86
1366	Eva M. Wilson	do	6	5 60
1367	L. S. Dorsey	do	6	5 70
1368	County Institutes	County Institute expense	7	450 00
	Frank Willey ....Christian Co....	$75 00		
	J. Kennedy Kincaid Menard Co.....	75 00		
	E. R. Hembrough. Morgan Co.....	75 00		
	R. O. Edminston..Randolph Co.....	75 00		
	H. J. Donaldson..Ogle Co.....	75 00		
	C. S. Thomas.....Brown Co.....	75 00		
1369	June salaries	Office help	1	726 74
1370	Illinois Bell Telephone	Telephone service	2	3 35
1371	R. H. Armbruster Mfg. Co	Awning	2	2 00
1372	Central Illinois Public Service Co.	Ice supply	2	1 40
1373	Meyer Electric Co	Light bulb	2	1 65
1374	Springfield Clean Towel Service...	Towel supply	2	1 25
1375	Burroughs Adding Machine		2	4 46
1376	Wm. H. Conkling	Postage	3	75 00
1377	American Railway Express Co.	Express charges	3	72 14
1378	A. M. Lavin	Mimeograph service	3	50 00
1379	Underwood Typewriter Co	Typewriter	4	57 08
1380	J. G. Imboden	Speakers' fees	5	60 00
1381	T. H. Roberts	do	5	10 00
1382	John T. Smith	do	5	10 00
1383	Mrs. S. E. Bradt	Institute Officers' expense	6	20 80
1384	Wm. Webb	do	6	23 29
1385	John Barrett	do	6	69 28
1386	H. E. Young	do	6	23 67
1387	County Institutes	County Institute expense	7	323 85
	J. Ray Stanner....Champaign Co....	$33 85		
	W. E. Grosenbach. Putnam Co.....	73 69		
	Harry E. Hall.....Schuyler Co.....	66 31		
	B. J. Kaufman.....Woodford Co....	75 00		
	L. F. Shoger..... Kendall Co.....	75 00		
1388	Central Ill. Public Service	Ice supply	2	1 40
1389	Hillier Storage Company	Drayage	2	2 70
1390	Ill. Bell Telephone Company	Telephone service	2	2 40
1391	Springfield Clean Towel Service...	Towel supply	2	1 25
1392	Addressograph Company	Addressograph cabinet	4	68 50
1393	John E. Barrett	Institute Officers' expense	6	20 44
1394	August Geweke	do	6	13 79
1395	Wm. Webb	do	6	12 61
1396	Geo. A. Switzer	do	6	19 83
1397	G. G. Hopping	do	6	13 87
1398	Everett M. Veatch	do	6	24 14
1399	John L. Hufford	do	6	6 14
1400	Geo. F. Tullock	do	6	21 48
1401	Ira B. Reed	do	6	15 87
1402	N. F. Goodwin	do	6	40 98
1403	Clayton C. Pickett	do	6	14 31
1404	H. E. Young	do	6	19 05
1405	County Institutes	County Institute expense	7	75 00
	Thos. H. Roberts..DeKalb Co.....	$75 00		
1406	Ralph Allen	Institute Officers' expense	6	14 30
1407	John E. Barrett	do	6	18 60

Your auditor would further report that he has checked the books of the secretary with the auditor's books and found them accurate and correct. The following is a summary of all the financial transactions to June 30, 1925:

Fund 1.	Salaries—Appropriation available July 1, 1924		$ 8,720 08
	Bills paid to June 30, 1925	$ 8,720 08	
	Balance June 30, 1925		8,720 08
Fund 2.	Office Expenses—Appropriation available July 1, 1924		2,103 86
	Bills paid to June 30, 1925	2,095 86	
	Balance June 30, 1925	8 00	
			2,103 86

AUDITOR'S REPORT—Concluded.

Fund 3.	Reporting—Appropriation available July 1, 1924		700 00
	Bills paid to June 30, 1925	641 75	
	Balance June 30, 1925	58 25	
			700 00
Fund 4.	Contingency—Equipment—Appropriations available July 1, 1924		400 00
	Bills paid to June 30, 1925	322 72	
	Balance June 30, 1925	77 28	
			400 00
Fund 5.	Speakers and Instructors—Appropriation available July 1, 1924		7,535 00
	Bills paid to June 30, 1925	7,370 00	
	Balance June 30, 1925	165 00	
			7,535 00
Fund 6.	General Expense—Appropriation available July 1, 1924		6,663 44
	Bills paid to June 30, 1925	5,300 48	
	Balance June 30, 1925	1,362 96	
			6,663 44
Fund 7.	Institute—Appropriation available July 1, 1924		8,659 34
	Bills paid to June 30, 1925	7,361 62	
	Balance June 30, 1925	1,297 72	
			8,659 34
Total appropriation available July 1, 1924			34,781 72
	Bills paid to June 30, 1925	31,812 51	
	Balance June 30, 1925	2,969 21	
			34,781 72

CLAYTON C. PICKETT, *Auditor.*

BY-LAWS

ILLINOIS FARMERS' INSTITUTE

Together with the Rules for the

Management for County Farmers' Institutes: Act Making Appropriation for the Illinois Farmers' Institute and County Farmers' Institutes for 1925 and 1926; Act to Enable County Boards of Supervisors and County Commissioners to Appropriate County Funds for the Use of County Farmers' Institutes, and an Act Creating the Illinois Farmers' Institute.

BY-LAWS OF ILLINOIS FARMERS' INSTITUTE.

Whereas, by act of the Thirty-ninth General Assembly, approved June 24, 1895, the Illinois Farmers' Institute was created, empowering its Board of Diretcors to adopt by-laws for its government and management of its business in connection with the act creating it, it hereby adopts the following by-laws and hereby repeals all former by-laws heretofore adopted by the Board of Directors.

ARTICLE I—DIRECTORS.

SECTION 1. Eleven members of the Board of Directors shall constitute a quorum for the transaction of business, except as may be otherwise provided by these by-laws.

SEC. 2. The Board of Directors shall hold a meeting in the Institute rooms at the State House, on the second Tuesday after the annual meeting of the Illinois Farmers' Institute, the old board to dispose of its business, the new board to organize, elect officers and outline its policy for the ensuing year, and to transact such other business as may come before the board.

SEC. 3. Each director shall be the confidential advisor of the board and of the secretary of institute concerning institute affairs in his district; he shall report to the secretary at the close of the institutes in his district upon all matters that seem significant to his work, in order that the secretary may have complete knowledge of the actual conditions in all parts of the State.

ARTICLE II—OFFICERS

SECTION 1. The officers of the Board of Directors shall consist of a president, vice president, secretary, treasurer and an auditor, to be elected by ballot by the Board of Directors, for the term of one year, whose term of office shall begin July 1, after their election.

SEC. 2. All officers of the Board of Directors must be members of the board, except the treasurer and the secretary.

SEC. 3. The Board of Directors shall have power at any time to fill vacancies which may occur in its membership.

SEC. 4. The compensation of all officers and employees shall be fixed previous to their election or employment.

ARTICLE III—PRESIDENT AND VICE-PRESIDENT.

SECTION 1. The president shall be the chief executive officer of the Board of Directors; shall appoint all committees; shall be ex officio member of all standing committees; he shall preside over the meeting of the Illinois Farmers' Institute, the Board of Directors and the Executive Committee, and perform all duties incumbent on a presiding officer.

SEC. 2. In case of the absence or disability of the president, or in case of vacancy in that office, the vice-president shall fill the office.

SEC. 3. In case of the absence or disability of these officers, or in case both offices become vacant, any director or member of the Executive Committee who is called to the chair shall act as president for the time being.

ARTICLE IV—DUTIES OF THE SECRETARY.

SECTION 1. The Secretary shall attend all meetings of the Board of Directors and standing committees, and shall keep a correct record of the same. He shall perform such other duties as usually devolve upon such officer. He shall act as secretary of the annual meeting of the delegates and keep a record of same. He shall certify all bids for expenditures duly

approved by the auditor, Executive Committee or Board of Directors, but shall not certify a bill on a fund unless there is sufficient money in the fund to pay such warrant.

SEC. 2. He shall have charge of all publications of the Institute and shall insert therein such matter as will advance the agricultural interests, and especially the work of the Illinois Farmers' Institute, under the direction of the Executive Committee. He shall arrange for and secure reports of State and other important institute meetings, making them a matter of record.

SEC. 3. The secretary shall be the custodian of all the records and papers belonging to, and all property owned by the Illinois Farmers' Institute, and shall report an inventory of all property of the Illinois Farmers' Institute to the Board of Directors at the close of each year; he shall make a detailed annual report in writing to the Board of Directors at the last meeting of the old board; he shall also make such other reports during the year as the Board of Directors or the Executive Committee may require.

SEC. 4. He shall organize a bureau of speakers, the same to include farmers, dairymen, horticulturists, livestock breeders, feeders and others who have adopted scientific and practical methods—secured beneficial results, and are able to tell about them, together with such instructors from the College of Argiculture and Experiment Station as may be assigned to the Institute work, and whose allotment of time shall be under his direction. These speakers shall be assigned work, as far as possible, in accordance with the wishes of the district director, officers of the Department of Household Science (where their interests may appear) and the county institute officers.

SEC. 5. The secretary of institutes shall attend the district conferences and aid in the arrangement of such circuits of institutes as will prove the most convenient for the attendance of speakers. He shall make a detailed annual report in writing to the Board of Directors, at its last meeting of his acts and doings during the year, together with a general summary of the Institute work of the State for the year; he shall also make such other reports during the year as the Board of Directors or Executive Committee may require.

ARTICDE V—DUTIES OF TREASURER.

SECTION 1. The treasurer shall have charge of any funds received by the State Institute, keeping an accurate account of same. He shall pay out the same on warrants signed by the president and countersigned by the secretary, issued on approved bills. He shall arrange for supplying the funds necessary for State meeting expenses which must be paid pending the settlement of same through the State Treasurer.

ARTICLE VI—AUDITOR.

SECTION 1. All bills for expenditures ordered by the Board of Directors or the Executive Committee and all bills contracted in pursuance of any appropriation shall be referred to the auditor.

SEC. 2. The auditor shall carefully examine all bills, and, when approved shall return them to the secretary with recommendations that same shall be certified for payment. In case a bill is not approved, it shall be referred to the Executive Committee.

SEC. 3. The auditor shall carefully examine all reports from county farmers' institutes and the bills for expenses of the same, and if in compliance with the law providing appropriations for county farmers' institutes and the rules prescribed by the Board of Directors either approve the same or if not approved, refer them to the Executive Committee.

SEC. 4. The auditor shall examine the books and records of the secretary and treasurer and make a detailed report of their financial transactions up to July 1, of each year, to the Board of Directors and at other times when directed to do so by the Board of Directors or the Executive Com-

mittee, and shall report the accounts against which no warrants have been drawn, in the different funds, and the balances in the hands of the treasurer to the credit of each fund.

ARTICLE VII—STANDING COMMITTEES.

SECTION 1. There shall be credited the folowing standing committees, the president appointing five members of each committee:

Executive Committee,
Legislative Committee,
Household Science Committee,
Highway Committee,
Committee on Agricultural Books,
Entomology Committee,
Committee on Soil Investigation and Experiments.

SEC. 2. The duties of standing committee, unless otherwise provided by these by-laws, shall be legislative in character; they shall meet at the same time and place that the Board of Directors' meetings are called, and at such other times as may be necessary, and shall make a written report to the Board of Directors at their annual meeting and at such other times as may be called for, said report to show progress made and future needs in their respective lines of work.

ARTICLE VIII—EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall conduct the affairs of the Illinois Farmers' Institute in the interval between the meetings of the Board of Directors in accordance with the rules and resolutions adopted by said board.

SEC. 2. It shall make all arrangements for holding the State Farmers' Institute meeting, assigning the time and place.

SEC. 3. It shall prepare a list of speakers for the use of county farmers' institutes.

SEC. 5. It shall be official advisor of the secretary of institutes when the Board of Directors is not in session.

SEC. 6. It shall meet on the call of the president of the Board of Directors.

ARTICLE IX—LEGISLATIVE COMMITTEE.

SECTION 1. The Legislative Committee shall prepare the bill or bills to be presented to the Legislature for enactment, and when the same shall have been approved by the Board of Directors or Executive Committee, shall take all necessary measures to have the same enacted.

ARTICLE X—HOUSEHOLD SCIENCE COMMITTEE.

SECTION 1. The Committee on Domestic Science shall counsel with the secretary of the Household Science Department and report upon measures for the advancement of the work of this department.

ARTICLE XI—AGRICULTURE BOOK COMMITTEE.

SECTION 1. The Agriculture Book Committee shall examine, and recommend, from time to time, such agricultural books as it may find to be true, scientific and applicable to Illinois conditions, and to recommend books for institute office library.

ARTICLE XII—HIGHWAY COMMITTEE.

SECTION 1. The Highway Committee shall co-operate with the Division of Highways, State Department of Public Works and Buildings, in its efforts to secure good roads and shall report from time to time such measures as may be recommended for the improvement of public highways.

ARTICLE XIII—ENTOMOLOGY.

SECTION 1. The Committee on Entomology shall be advisory to the State Entomologist in the planning experiments for the prevention of damage to crops by injurious insects, and make report to the Board of Directors of the progress of the work.

ARTICLE XIV—COMMITTEE ON SOIL INVESTIGATION AND EXPERIMENTS.

SECTION 1. The Committee on Soil Investigation and Experiments shall advise and co-operate with the director of the Agricultural Experiment Station in making chemical and physical examination of the various soils of the State, and in ascertaining by direct experiment in laboratory and field, the crops and treatment best suited to each; it shall visit the soil experiment fields and report to the Board the result of the investigations and experiments.

ARTICLE XV—AMENDMENTS.

SECTION 1. These by-laws may be amended at any regular meeting of the Board of Directors by a majority of those present voting in the affirmative.

ARTICLE XVI—RULES.

SECTION 1. Robert's Rules of Order shall govern in all cases not otherwise provided for.

RULES FOR THE MANAGEMENT OF COUNTY FARMERS' INSTITUTES.

RULE 1. The director of each district consisting of more than one county shall, at the request of the Executive Committee, or the secretary of institutes, call a conference of delegates from the several counties of his district, at some convenient point, consisting of the following:

(a) One officer (or person selected by the officers) of each county farmers' institute.

(b) One officer (or person selected by the officers) of the department of household science of each county farmers' institute. (In counties in which the department is not organized, the officers of the county farmers' institute may appoint a delegate to represent the women of the county with the express understanding that said delegate shall, prior to the time for holding the county farmers' institute, make faithful effort to organize such department.)

(c) The county superintendent of schools for each county in the district.

The purpose of these conferences is to arrange the times and places for holding the next county institutes and to cooperate in securing speakers.

All necessary expenses of the said three delegates in attending the district conference shall be paid by the Illinois Farmers' Institute upon itemized bills approved by the director of the district.

NOTE 1. Rule 1 does not prohibit the attendance at the conference of more than three delegates. Indeed the number who may attend is unlimited; but the expenses of three only can be allowed from the State Institute funds.

NOTE 2. Delegates from independent institutes are invited to come to the conference at their own expense. Their requests for speakers, however, will receive the same attention by the secretary of institutes as those coming from the regular county organization. The purpose of the conferences is to help everybody who will assist in the dissemination of agricultural information.

RULE 2. The director's approval shall be required in fixing the dates of the institutes in his district.

RULE 3. The secretary of each county institute shall submit the completed institute program to the district director for his approval before having it printed and distributed, and this shall be done at least twenty days prior to the time for holding the institute.

RULE 4. As soon as practicable after printing the programs, the secretary of each institute shall send two or more copies to each of the following:

The District Director.

Secretary, H. E. Young, Springfield, Illinois.

Each of the speakers whose names appear upon the program.

RULE 5. The date or place for holding an institute shall not be changed, from that determined upon at the district conference without the approval of the district director and the secretary of institutes.

RULE 6. No part of the State fund shall be expended for music, recitation, amusements of any kind, or for premiums.

RULE 7. No county farmers' institute meeting shall be held in connection with a street or county fair, a political meeting, a circus, or any similar attraction.

RULE 8. The publication and mailing of a copy of these rules to each county institute officer shall be deemed sufficient notice that vouchers for expenses prohibited herein will not be paid by the State.

RULE 9. Nothing in these rules shall be so construed as to prohibit a county farmers' institute from expending its own money as the officers may deem proper. The State fund must be expended in accordance with the rules here given.

RULE 10. In the case of removal from the county or refusal to act, on the part of any county institute officer, the director of the district shall appoint a suitable person to fill the vacancy, and this appointee shall serve until his successor shall have been elected at the next regular election.

ACT MAKING AN APPROPRIATION FOR THE ILLINOIS FARMERS' INSTITUTE AND COUNTY FARMERS' INSTITUTES FOR THE BIENNIUM BEGINNING JULY 1, 1925.

(Approved June 5, 1925, in force July 1, 1925.)

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That the following named sums, or so much thereof as may be necessary, respectively, for the purposes hereinafter named for the biennium beginning July 1, 1925, and until the expiration of the first fiscal quarter after the adjournment of the next General Assembly, be and are hereby appropriated to the boards, societies, associations and organizations following, to-wit:

SEC. 7. To the Illinois Farmers' Institute:

For salaries and wages:

Secretary	$3,600	per annum
Stenographer	1,320	per annum
Clerk	1,800	per annum
Secretary, Department Household Science	2,000	per annum
Reporting proceedings	700	per annum
		$18,840.00
For office expenses		$ 4,200.00
For equipment		200.00
For contingencies		200.00
For speakers and field work		14,000.00
For county institutes		15,300.00
For officers' expenses and State institutes		12,000.00
Total		$64,740.00

ACT TO ENABLE COUNTY BOARDS OF SUPERVISORS IN COUNTIES UNDER TOWNSHIP ORGANIZATION AND COUNTY COMMISSIONERS IN COUNTIES NOT UNDER TOWNSHIP ORGANIZATION, TO APPROPRIATE COUNTY FUNDS FOR USE OF COUNTY FARMERS' INSTITUTES.

(Approved June 5, 1911.)

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That it shall be lawful for county boards of supervisors in counties under township organization, and for county commissioners in counties not under township organization, to appropriate funds from the county treasury for use of county farmers' institutes in their efforts to promote the adoption of the latest approved methods of crop production, the improvement of livestock, the conservation of soil fertility, and the improvement of agricultural conditions generally: *Provided*, that in no case shall it be lawful for a county board to appropriate more than three hundred dollars ($300) in any one year for the above purposes.

AN ACT CREATING THE ILLINOIS FARMERS' INSTITUTE.

Approved June 24, 1895. Amended and approved May 11, 1901. Amended and approved May 15, 1903. Amended and approved June 10, 1909. Amended and approved June 28, 1919.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That to assist and encourage useful education among the farmers, and for developing the agricultural resources of the State, that an organization under the name and style of "Illinois Farmers' Institute" is hereby created, and declared a public corporation of the State.

SEC. 2. It shall consist of three delegates from each county of the State, elected annually at the farmers' institutes for said county by the members thereof.

SEC. 3. The affairs of the Illinois Farmers' Institute shall be managed by a Board of Directors, consisting of:

1. State Superintendent of Public Instruction.
2. Dean of Agriculture, University of Illinois.
3. Director of State Department of Agriculture.
4. President of the State Dairymen's Association, and one member from each congressional district of the State, to be selected by the delegates from the district present at the first annual meeting of this organization: *Provided*, that the members first selected from the congressional districts of even numbers shall serve one year, and the members first selected from the congressional districts of odd numbers shall serve for two years, and that the members selected thereafter to fill the expired term of office shall serve for the period of two years.

SEC. 4. The Board of Directors of the Illinois Farmers' Institute shall have sole care and disposal of all sums that may be appropriated by the State to sustain the organization, and shall expend the same in such manner as in their judgment will best promote the interests in useful education among the farmers and develop the agricultural resources of the State. The Illinois Farmers' Institute shall make annual report to the Governor of its transactions, which report shall include papers pertaining to its work and addresses made at the annual meeting of the organization, and a classified statement of all money received and of all expenditures made, and fifty thousand (50,000) copies of such report shall be printed and bound in cloth on or before September 1, of each fiscal year, three-fourths for the use of the Illinois Farmers' Institute, and the remainder to the Secretary of State for distribution. It shall make no appropriation without funds in hand to meet the same, and the State of Illinois shall in no event be held liable or responsible for debt, obligation or contract made by the Illinois Farmers' Institute or its Board of Directors.

SEC. 5. There shall be held annually, under the direction of the Board of Directors, between October 1 and March 1, following of each year, a public meeting of the delegates from county farmers' institutes and of farmers of this State at such time and place as may be determined by the Board of Directors, of not less than three (3) days' duration, which meeting shall be held for the purpose of developing the greater interest in the cultivation of crops, in the care and breeding of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improved highways and general farm management through and by means of liberal discussions of these and kindred subjects and any citizen may take part in these meetings, but only duly elected and accredited delegates from county farmers' institutes shall be permitted to vote in the election of the Board of Directors.

SEC. 6. The members of each new Board of Directors shall enter upon their duties the second Tuesday after their election, and hold their offices for one or two years, as provided in section 3, or until their successors are elected and enter upon their duties. The Board of Directors shall have power to fill vacancies in the board. It shall organize by the election of a president, vice-president, treasurer and secretary, who shall hold their offices for one year, from the date of their election, or until their successors are elected and qualified. It shall employ such superintendents, speakers and clerks as may be deemed proper for organizing and conducting the work of the Illinois Farmers' Institute, and provide for their compensation by the rules of the Board of Directors. The secretary and treasurer may be other than members of the Board of Directors.

SEC. 7. Rooms in the Capitol building, shall be assigned to the officers of this organization by the proper authority, which shall then be under the control of the Board of Directors.

SEC. 8. The Board of Directors may make and enforce such rules and by-laws, not in conflict with the laws of this State, as will render its work most useful and efficient.

SEC. 9. For the purposes mentioned in the preceding sections, said Board of Directors may use such sums as it may deem proper and necessary, not exceeding the amount appropriated therefor by the General Assembly from the general fund, for that purpose: *Provided, further*, that the

1. State Superintendent of Public Instruction,
2. Dean of Agriculture, University of Illinois,
3. Director of State Department of Agriculture,
4. President of the State Horticultural Society,
5. President of the State Dairymen's Association.

And the present congressional representatives of the Illinois Farmers' Institute Association shall constitute the first Board of Directors of this organization, who shall have charge of the affairs of the same until their successors have been duly elected, and enter upon their duties as provided in this act.

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Additional copies free upon request
Illinois Farmers' Institute
H. E. Young, Secretary
Springfield, Ill.